Department of Environmental Protection

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

December 29, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Joe Anderson, III
President
Suwannee American Cement Company, Inc.
PO Box 410
Branford, Florida 32008

Re: Request for Additional Information
DEP File No. 1210465-001-AC (PSD-FL-259)
Proposed Portland Cement Plant

Dear Mr. Anderson:

On November 30, 1998 the Department received your application and complete fee for an air construction permit for a Portland cement plant at US 27 at County Road 49, east of Branford. The application is incomplete. In order to continue processing your application, the Department will need the additional information requested below. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form.

1. Please finalize the design of the precalciner and submit revised drawings that do not show this process as "on hold". Provide a description of the final process design selected. We understand the applicant is considering utilizing a tire gasification system to fuel the precalciner burner. If this option has been selected, please provide a process description of the gasification system, describe how the solid byproducts of the gasification system will be utilized in the cement process, and discuss the impact of the gasification system on emissions.

2. The application proposes the use of tires to provide up to 40% of the heat input to the pyroprocessing system. Representatives from Krupp Polysius stated that firing no more than 10% tires is practically achievable without the use of a tire gasification system. Further, the proposed volume of tires may result in no fuel being fed to the precalciner which would provide no supplemental heat in the flue gas downstream of the kiln end feed shelf (which we presume will be the introduction point for tires). Operation of this sort seems to violate the principles of NOx control by process design described on page 49 of the supplemental report, in which more fuel is fired in the precalciner than the kiln. Please propose a volume of amount of tires that comports with the recommendation of the pyroprocessing system's manufacturer, or provide more information to support the requested feed rate. Please verify the location of the feed point for tires or TDF.

3. Please finalize the design of the particulate control devices for the in line kiln/raw mill and the clinker cooler and submit revised drawings that do not show the control device for the clinker cooler as "under review". Provide a description of the final control devices selected, and specifications for each device.

4. The Department believes that BACT at this facility for PM_{10} should at a minimum meet the same emission limits as at LaFarge Corporation's plant included in the BACT determinations shown in Table 14. Please comment.

5. The sample sulfur dioxide reduction calculations were based on coal with a sulfur content of 1.5%. Please evaluate the proposed sulfur limits and reduction required with the proposed coal and petcoke. Also comment on the relative merits of limiting percent sulfur in the fuel versus solely limiting emissions of sulfur dioxide. EPA has commented to the Department that the feasibility of a cement kiln SO2 emission rate limit of 0.27 lb/ton clinker (versus the proposed 0.28 lb/ton clinker limit) should be addressed. Please also address EPA's comment.

6. Please comment on the feasibility of combining the proposed selected BACT control technologies (process control, secondary combustion, indirect firing) with SNCR. It appears that the proposed selected technologies are integral to the plant design so such a combination appears possible. If the proposed selected technologies are not integral to the plant design, please provide a detailed cost analysis for them in terms of overall and marginal cost effectiveness (annualized dollars/ton of nitrogen oxides removed) for NOx control using these technologies, including all references and assumptions.

7. Please provide a detailed cost analysis in terms of overall and marginal cost effectiveness (annualized dollars/ton of nitrogen oxides removed) for NOx control using SNCR, including all references and assumptions. Krupp Polysius markets an SNCR system for Portland cement plants that should be directly applicable to this project so cost and effectiveness estimates for this project should be detailed. Although the Krupp Polysius system uses ammonia water transported to the site as the reactant, please comment on the feasibility of using anhydrous ammonia to generate the reactant on site.

8. Please compare other NOx limits established by BACT (for LaFarge and Great Star Cement, for example) with the proposed NOx limit and discuss the variables that affect emissions of NOx from Portland cement plants that are applicable to the proposed facility.

9. Although the temporary exemption language of Rule 62-212.400(3)(c), F.A.C., provides for exemption from certain PSD requirements for emissions lasting up to two years, such time period for NOx seems excessive given Krupp Polysius' experience with the startup of similar facilities, and the experience it will gain with the startup of the similar Florida Rock plant (which is scheduled to begin operation prior to completion of this facility). EPA has also commented to the Department that the applicant should address the feasibility of meeting the proposed BACT NOx emission limit <u>at startup</u> of the facility. Please address this issue.

10. EPA has commented to the Department that the applicant should discuss why a reduced kiln CO emission rate limit would not be proposed as BACT, given that the RBLC listings have several kilns with lower CO emission rate limits. EPA has suggested that such a discussion should include a technical and economic analysis regarding the feasibility of a 1.64 lb/ton clinker (LaFarge Corporation, Sugar Creek, Missouri, Permit No. 0897-019, issued August 20, 1997) kiln CO emission rate limit, or a CO emission rate limit of 2.77 lb/ton clinker (June 3,1998, dry process kiln operations at Signal Mountain Cement Company located at Chattanooga, Tennessee). Please address this issue.

11. Provide the worst case startup and shutdown emissions estimates for the inline kiln/raw mill including duration of excess emissions. The Department plans to address excess emissions in its BACT determination.

12. Please comment on the need to include estimated emissions of PM_{10} from prescribed burning at Ichetucknee Springs State Park in the PM_{10} impact analysis for the proposed facility.

13. Please discuss the basis for the estimated emissions of mercury and provide illustrative calculations. Please estimate the possible impact or deposition of mercury at the Ichetucknee Springs State Park and the Santa Fe and Suwannee Rivers in the vicinity of the proposed facility.

14. Please perform an additional impact analysis in the PSD Class II area near the facility including the Ichetucknee Springs State Park and the Santa Fe and Suwannee Rivers in the vicinity of the proposed facility. This analysis must include impacts on growth, soils and vegetation, and visibility.

15. Please submit overlays (isopleths) of the maximum ground-level concentrations of NO_x, PM/PM_{10}, CO, and SO_2 with respect to residential communities up to 2 miles (3.2 kilometers) from the proposed site.

16. The PSD application does not contain discussions of the modeling procedures, selected model options, source emission information, and receptor information associated with the area of significance, PSD increment, and NAAQS modeling. This information is needed to adequately understand the modeling results presented in the application. In addition, please provide a detailed map showing the location of all of the fence-line receptors used in the air quality impact analysis. These receptor locations should be shown in the coordinate system used in the modeling. This detailed map should also display the location and dimensions of the various plant components.

17. The emission sources used for both the NAAQS and PSD compliance modeling were selected based on the 20D rule. This rule does not consider the additive effects of a number of sources located in the same general location. Review of the 20D rule eliminated sources reveals a few NO_x and many PM_{10} sources that may need to be included in the impact modeling emission inventories. In addition, the application of the 20D rule starts at the edge of the significant impact area (7 km in this case) instead of at the center of the facility.

18. Regarding secondary emissions, the PSD application does not address any increase in quarry production due to the operation of the Portland cement facility. Any increase in quarry emissions associated solely with the operation of the cement plant must be included in the cement company's PSD air quality impact assessment.

19. The PSD application does not provide specific modeling emission information associated with the cement company's operation. The individual emission sources for each applicable pollutant should be provided along with the location, emission rates, and stack/vent exit variables (e.g., exit temperature, velocity, etc.) for each appropriate level of operation (e.g., 50%, 75% and 100% loads). Where applicable, the emission rates and exit variables should be provided for each fuel source. The basis for each pollutant emission rate should be provided.

20. Lennon Anderson of the Bureau of Air Regulation provided comments related to the MACT determination for the proposed facility. Please provide a proposed MACT pursuant to 40 CFR 63.43(d) and (e). Please provide a MACT analysis including any new, similar emission sources contacted (best performing source).

21. In addition to addressing the previous comments from Mr. Anderson, please comment on the likely emissions of hydrogen chloride from the proposed process considering the design, fuels, and raw materials.

The Air Quality Branch, National Park Service–Denver (NPS) provided comments to the Department. Those comments are enclosed for your information and the significant requests have been reiterated below.

22. The NPS commented to the Department that the applicant should re-evaluate the feasibility of applying SNCR to control NO_x emissions from its proposed cement kiln. The NPS commented that the applicant incorrectly rejected SNCR by questioning its availability, by failing to document and compare estimated control costs, and by overstating environmental risks associated with the use of ammonia. The NPS suggested that the applicant provide well-documented costs for application of SNCR as well as a comparison to the costs of applying SNCR to the similar Great Star Cement facility. Please address these comments.

23. The NPS commented to the Department that the applicant did not perform visibility analyses to evaluate potential impacts to regional haze at Okefenokee or Chassahowitzka wildernesses. The NPS commented that the applicant incorrectly concluded that because predicted impacts to the Class I increments were less than significant, no air quality related values (AQRV) analyses were required. The NPS stated that increment analyses are independent of AQRV analyses; Class I increments were never intended to protect Class I AQRVs. Therefore, the applicant should perform regional haze analyses, following the recommendations of the Interagency Workgroup on Air Quality Modeling at: http://www.epa.gov/scram001/; "Model Support"; "6th Modeling Conference"; "IWAQM". Please address these comments.

24. In addition to addressing the previous comments from the NPS for the Okefenokee or Chassahowitzka wildernesses, please address these issues for the St. Marks and Bradwell Bay wilderness areas, and perform an increment analysis and analysis of other AQRVs for these areas as well.

Because of significant public interest in this project, the Department will conduct a public meeting regarding this project. We will advise you of the schedule should you wish to attend.

Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. Permit applicants are advised that Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days. If there are any questions, please call me at 850/921-9519. Matters regarding modeling issues should be directed to Cleve Holladay (meteorologist) at 850/921-8986. Matters regarding the MACT determination may be directed to Lennon Anderson at 850/921-9588.

Sincerely,

Joseph Kahn, P.E.
New Source Review Section

/jk

Enclosure

cc: Mr. Frank Darabi, P.E.
Mr. Steve Cullen, P.E.
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS
Mr. Chris Kirts, NED
Mr. Jim Stevenson, DEP Ecosystem Mgmt.
Mr. Tom Workman, DEP Recreation & Parks
Ms. December McSherry
Mr. Svenn Lindskold
Mr. Tom Greenhalgh
Mr. Al Mueller

Fold at line over top of envelope to the right of the return address.

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- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- 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.
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3. Article Addressed to:
Joe Anderson, Pres.
Suwannee American
PO Box 410
Branford, Fl
32008

4a. Article Number
Z 333 612 579

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
1-20-99

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X [signature]

PS Form 3811, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

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Receipt for Certified Mail
No Insurance Coverage Provided.
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Sent to: Joe Anderson	
Street & Number: Suwannee American	
Post Office, State, & ZIP Code: Branford Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
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Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: 12-29-98 1210465-001-AC PSD-Fl-259	

PS Form 3800, April 1995

Re: PSD-FL-259

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Our Air Quality Branch has reviewed the Prevention of Significant Deterioration Application for Suwannee Cement Company's proposal to construct a new cement plant in Branford, Florida. The facility is located 83 km southwest of Okefenokee Wilderness and 88 km north of Chassahowitzka Wilderness, both Class I air quality areas administered by the U.S. Fish and Wildlife Service. The technical review comments from our Air Quality Branch are enclosed. Specifically, we recommend that your department require Suwannee to re-evaluate its proposed control technology for nitrogen oxides emissions. Also, we ask that Suwannee be required to evaluate potential impacts from the new emissions to regional haze at the two Class I areas.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have questions, please contact Ellen Porter of our Air Quality Branch in Denver at (303) 969-2617.

Sincerely,

Sam D. Hamilton
Regional Director

Enclosures

cc: Doug Neeley, Chief
Air and Radiation Branch
U.S. EPA, Region IV
100 Alabama St., SW
Atlanta, Georgia 30303

Technical Review of Prevention of Significant Deterioration Permit Application For a New Cement Plant Suwannee American Cement Company Branford, Florida PSD-FL-259

by

Air Quality Branch, Fish and Wildlife Service – Denver
December 15, 1998

Suwannee American Cement Company (Suwannee) is proposing to construct a new cement plant in Branford, Suwannee County, Florida. The cement plant will be a dry process preheater/precalciner kiln, producing 2,300 tons per day of clinker, and up to 1,191,360 tons per year of various types and grades of Portland cement. The primary fuels will be coal and petroleum coke. Natural gas will be used as a startup fuel and supplemental fuel. Whole tires and/or tire-derived fuel will be used as a supplemental fuel. The facility is located 83 km southwest of Okefenokee Wilderness and 88 km north of Chassahowitzka Wilderness, both Class I air quality areas administered by the U.S. Fish and Wildlife Service (FWS). This project will result in PSD-significant increases in emissions of nitrogen oxides (NO_X), sulfur dioxide (SO_2), volatile organic compounds (VOC), particulate matter (PM), fine particulate matter less than 10 microns in diameter (PM-10), and carbon monoxide (CO). Emissions (in tons per year – TPY) are summarized below.

POLLUTANT	EMISSIONS INCREASE (TPY)
NO_X	1175
SO2	118
VOC	50
PM	267
PM-10	228
CO	1511

All significant PM and PM-10 emission points will be controlled by baghouses, and kiln SO_2 emissions will be controlled by the alkaline dust captured by the baghouse. NO_x is to be controlled by indirect heating.

Best Available Control Technology (BACT) Analysis

With the exception of NO_x, controls proposed for all emissions appear to represent BACT. The BACT analysis for NO_x is deficient in that it dismisses the application of Selective Non-Catalytic Reduction (SNCR) on the basis of adverse economic and environmental impacts. Suwannee estimates that NO_x removal would cost $1216/ton and states that "costs for NO_x removal using SNCR or any add-on controls are disproportionately high when compared to the costs of controls for NO_x emissions from other cement plants in recent BACT determinations." However, Suwannee does not provide any calculations or documentation to support the

$1216/ton removal cost at the proposed facility, or any comparative costs at other plants, including the Great Star Cement plant in Nevada where SNCR is required by a permit. For other industrial processes, NO_x control is typically $4000/ton; $1216/ton does not seem excessive.

Suwannee states that the availability of SNCR, and therefore its technical feasibility, is questionable because the RACT/BACT/LAER Clearinghouse record for the Great Star Cement plant is over two years old. In fact, construction has not begun on the plant. However, the EPA New Source Review Workshop Manual (Manual) provides guidance on "availability:"

> Two key concepts are important in determining whether an undemonstrated technology is feasible: "availability" and "applicability." As explained in more detail below, a technology is considered "available" if it can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term. An available technology is "applicable" if it can reasonably be installed and operated on the source type under consideration. A technology that is available and applicable is technically feasible.

Obviously, SNCR is an available technology as it is in use in numerous applications around the world, and is to be applied to the Great Star Cement plant if it is ever built. As for "applicability," the Manual states:

> Commercial availability by itself, however, is not necessarily sufficient basis for concluding a technology to be applicable and therefore technically feasible. Technical feasibility, as determined in Step 2, also means a control option may reasonably be deployed on or "applicable" to the source type under consideration.
>
> Technical judgment on the part of the applicant and the review authority is to be exercised in determining whether a control alternative is applicable to the source type under consideration. In general, a commercially available control option will be presumed applicable if it has been or is soon to be deployed (e.g., is specified in a permit) on the same or a similar source type.

Because SNCR is available and has been "specified in a permit" issued to a similar facility in Nevada, it must be considered technically feasible for Suwannee.

Finally, Suwannee notes that the ammonia used in SNCR presents a risk of environmental degradation. However, ammonia is routinely used in SNCR, SCR, and other industrial process at countless locations everyday and should not constitute a reason for rejection of SNCR merely because of its nature and presence. It is widely recognized that, with proper operation and maintenance procedures, ammonia can be handled and stored safely.

Conclusions & Recommendations

Suwannee should re-evaluate the feasibility of applying SNCR to control NO_x emissions from its proposed cement kiln. Suwannee has incorrectly rejected SNCR by questioning its availability, by failing to document and compare estimated control costs, and by overstating environmental risks associated with the use of ammonia. Suwannee should provide well-documented costs for application of SNCR as well as a comparison to the costs of applying SNCR to the similar Great Star Cement facility.

Air Quality Related Values (AQRV) Analysis

Suwannee did not perform visibility analyses to evaluate potential impacts to regional haze at Okefenokee or Chassahowitzka wildernesses. Suwannee incorrectly concluded that because predicted impacts to the Class I increments were less than significant, no air quality related values (AQRV) analyses were required. However, increment analyses are independent of AQRV analyses; Class I increments were never intended to protect Class I AQRVs. Therefore, Suwannee should perform regional haze analyses, following the recommendations of the Interagency Workgroup on Air Quality Modeling at: http://www.epa.gov/scram001/; "Model Support"; "6th Modeling Conference"; "IWAQM".

Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

MEMORANDUM

TO: Joe Kahn, P.E.

FROM: Lennon Anderson

SUBJECT: Request for Additional Information
Suwannee American Cement Company
Permit No. 1210465-001-AC

DATE: December 28, 1998

If you have not yet sent out a letter requesting additional information on the subject facility, please include the following to assist with the MACT determination:

1. A proposed MACT pursuant to 40 CFR 63.43(d) and (e)

2. A MACT analysis including any new, similar, emission sources contacted (best performing source).

If there are any questions, I can be reached at 954/849-0528; otherwise, I will see you tomorrow.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

IN REPLY REFER TO:

Re: PSD-FL-259

DEC 22 1998

RECEIVED

JAN 04 1999

BUREAU OF
AIR REGULATION

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-2400

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Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have any questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at 303/969-2617.

Sincerely yours,

Judy Jones

for Sam D. Hamilton
Regional Director

Enclosure

cc: J. Kahn, BAR

Technical Review of Prevention of Significant Deterioration Permit Application
For a New Cement Plant
Suwannee American Cement Company
Branford, Florida
PSD-FL-259

by

Air Quality Branch, Fish and Wildlife Service – Denver
December 15, 1998

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With the exception of NO_x, controls proposed for all emissions appear to represent BACT. The BACT analysis for NO_x is deficient in that it dismisses the application of Selective Non-Catalytic Reduction (SNCR) on the basis of adverse economic and environmental impacts. Suwannee estimates that NO_x removal would cost $1216/ton and states that "costs for NO_x removal using SNCR or any add-on controls are disproportionately high when compared to the costs of controls for NO_x emissions from other cement plants in recent BACT determinations."

However, Suwannee does not provide any calculations or documentation to support the \$1216/ton removal cost at the proposed facility, or any comparative costs at other plants, including the Great Star Cement plant in Nevada where SNCR is required by a permit. For other industrial processes, NO_x control is typically \$4000/ton; \$1216/ton does not seem excessive.

Suwannee states that the availability of SNCR, and therefore its technical feasibility, is questionable because the RACT/BACT/LAER Clearinghouse record for the Great Star Cement plant is over two years old. In fact, construction has not begun on the plant. However, the EPA New Source Review Workshop Manual (Manual) provides guidance on "availability:"

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Obviously, SNCR is an available technology as it is in use in numerous applications around the world, and is to be applied to the Great Star Cement plant if it is ever built. As for "applicability," the Manual states:

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>
> Technical judgment on the part of the applicant and the review authority is to be exercised in determining whether a control alternative is applicable to the source type under consideration. In general, a commercially available control option will be presumed applicable if it has been or is soon to be deployed (e.g., is specified in a permit) on the same or a similar source type.

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Finally, Suwannee notes that the ammonia used in SNCR presents a risk of environmental degradation. However, ammonia is routinely used in SNCR, SCR, and other industrial process at countless locations everyday and should not constitute a reason for rejection of SNCR merely because of its nature and presence. It is widely recognized that, with proper operation and maintenance procedures, ammonia can be handled and stored safely.

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Suwannee should re-evaluate the feasibility of applying SNCR to control NO_x emissions from its proposed cement kiln. Suwannee has incorrectly rejected SNCR by questioning its availability, by failing to document and compare estimated control costs, and by overstating environmental risks associated with the use of ammonia. Suwannee should provide well-documented costs for application of SNCR as well as a comparison to the costs of applying SNCR to the similar Great Star Cement facility.

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Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

INTEROFFICE MEMORANDUM

Date: 22-Dec-1998 04:13pm
From: Kukier.Stan
Kukier.Stan@epamail.epa.gov@PMDF@EPIC66
Dept:
Tel No:

To: holladay_c (holladay_c@A1@DER)
To: kahn_j (kahn_j@A1@DER)

Subject: Suwanee American Cement Company - Branford, FL, PSD-FL-259

DRAFT COMMENTS - FOR YOUR INFORMATION ONLY
Joseph,

Based on a preliminary review of the application information submitted thus far, I have the following draft comments:

NOx emissions

1. The applicant should provide a detailed explanation regarding whether or not a kiln NOx emission rate limit of 2.8 lb/ton clinker is feasible at startup. A review of the RBLC listings for two other dry process kilns located in Florida indicate that both Florida Rock Industries and Florida Crushed Stone are presently operating kilns with the reduced NOx emission rate limit (2.8 lb/ton clinker). It appears that final permits for both of the above facilities were issued more than two years ago. Detailed particulate matter, SO2, NOx, CO, and VOC emission rate calculations, including all references and assumptions, should also be provided. Detailed cost effectiveness/economic calculations for each of the add-on control options discussed in Section 3.13 (e.g., low-NOx burners, SCR, and SNCR), including all references and assumptions, should be provided by Suwannee American Cement. Discussions with Florida DEP staff indicate that an SNCR add-on NOx emission control system is available from the kiln vendor. A detailed discussion of the kiln vendor's SNCR system regarding both technical/economic feasibility should be included in Suwannee American Cement's BACT review for cement kiln NOx emissions. The applicant proposes a NOx emission rate limit of 3.8 lb/ton clinker as BACT for the cement kiln.

CO emissions

2. A review of RBLC listings reveals that lower cement kiln CO emission rate limits have recently been determined BACT for several other similar Portland cement plants. A discussion of why a reduced kiln CO emission rate limit would not be proposed as BACT by the applicant, should be included in the submittal. A technical and economic analysis regarding the feasibility of a 1.64 lb/ton clinker (LaFarge Corporation, Sugar Creek, Missouri, Permit No. 0897-019, issued August 20, 1997) kiln CO emission rate limit should be included in Suwannee's submittal. A CO emission rate limit of 2.77 lb/ton clinker has also recently (June 3,1998) been determined BACT for dry process kiln operations at Signal Mountain Cement Company located at Chattanooga, Tennessee. BACT analysis related

information regarding the Signal Mountain Cement Company kiln CO emission rate limit was faxed to Florida DEP on December 18, 1998. The applicant proposes a CO emission rate limit of 3.6 lb/ton clinker as BACT for the cement kiln.

SO2 emissions

3. A technical and economic analysis regarding the feasibility of a reduced cement kiln SO2 emission rate limit (0.27lb/ton clinker) should also be included in the applicant's BACT review. The applicant proposes an SO2 emission rate limit of 0.28 lb/ton clinker for the new cement kiln.

Modeling/Monitoring: (draft comments are attached per Stan Krivo)

If you have any questions, please contact Stan Krivo or myself. If there are any questions regarding the applicability of 40 CFR Part 63, Subpart LLL (Portland Cement Manufacturing Industry), please contact Lee Page at (404)562-9131. I hope these draft comments are helpful.

Stan Kukier
EPA-Region 4

Date: 18 December 1998

To: Stan Kukier

From: Stan Krivo

Subject: Initial Review Air Quality Impact Assessment
Suwannee American Cement Company PSD Application
Branford, FL

The following are comments and questions resulting from my initial review of the air quality impact assessment for the proposed Suwannee American Cement Company facility to be located at an existing limestone quarry near Branford, FL.

1. Secondary Emissions - The PSD application does not address any increase in quarry production due to the operation of the Portland cement facility. Any increase in quarry emissions associated solely with the operation of the cement plant must be included in the cement company's PSD air quality impact assessment.

2. Cement Company Emission Information - The PSD application does not provide specific modeling emission information associated with the cement company's operation. The individual emission sources for each applicable pollutant should be provided along with the location, emission rates, and stack/vent exit variables (e.g., exit temperature, velocity, etc.) for each appropriate level of operation (e.g., 50%, 75% and 100% loads). Where applicable, the emission rates and exit variables should be provided for each fuel source. The basis for each pollutant emission rate should also be provided.

3. Shakedown Period - The applicant requests a 2-year shakedown period with increased NOx emissions. It was indicated that the impact modeling provided used the increased emission rate. This appears to be an unusually long shakedown period.

4. Modeling Data Diskettes - Diskettes containing the modeling input and output files were not included with the PSD application. Because the application contains little specific modeling information, the model input and output files are needed.

5. PSD and NAAQS Modeling - The PSD application does not contain discussions of the modeling procedures, selected model options, source emission information, and receptor information associated with the Area of Significance, PSD increment

, and NAAQS modeling. This information is needed to understand the modeling results presented in the application.

6. Other Emission Sources - The emission sources used for both the NAAQS and PSD compliance modeling were selected based on the 20D rule. This rule, which is not a guideline procedure, does not consider the additive effects of a number sources located in the same general location. Review of the 20D rule eliminated emission sources reveals a few NOx and many PM10 sources that may need to be included in the impact modeling emission inventories.

7. Facility Plot Plan - A plot plan displaying the location and dimensions of the various plant components and the site boundary is needed to determine and understand the input variables used in the modeling.

8. Class I Area Impacts - The results of the Okefenokee National Wilderness Area Class I impact assessments need to be reviewed by the U.S. Fish and Wildlife Service and the Okefenokee Land Manager. The application did not include visual range nor regional haze assessments.

I plan on discussing the above initial review comments with Cleve Holladay of FL DEP. Please let me know if you have any questions or need further information on my initial review of this application.

Date: 18 December 1998

To: Stan Kukier

From: Stan Krivo

Subject: Initial Review Air Quality Impact Assessment
Suwannee American Cement Company PSD Application
Branford, FL

The following are comments and questions resulting from my initial review of the air quality impact assessment for the proposed Suwannee American Cement Company facility to be located at an existing limestone quarry near Branford, FL.

1. Secondary Emissions - The PSD application does not address any increase in quarry production due to the operation of the Portland cement facility. Any increase in quarry emissions associated solely with the operation of the cement plant must be included in the cement company's PSD air quality impact assessment.

2. Cement Company Emission Information - The PSD application does not provide specific modeling emission information associated with the cement company's operation. The individual emission sources for each applicable pollutant should be provided along with the location, emission rates, and stack/vent exit variables (e.g., exit temperature, velocity, etc.) for each appropriate level of operation (e.g., 50%, 75% and 100% loads). Where applicable, the emission rates and exit variables should be provided for each fuel source. The basis for each pollutant emission rate should also be provided.

3. Shakedown Period - The applicant requests a 2-year shakedown period with increased NOx emissions. It was indicated that the impact modeling provided used the increased emission rate. This appears to be an unusually long shakedown period.

4. Modeling Data Diskettes - Diskettes containing the modeling input and output files were not included with the PSD application. Because the application contains little specific modeling information, the model input and output files are needed.

5. PSD and NAAQS Modeling - The PSD application does not contain discussions of the modeling procedures, selected model options, source emission information, and receptor information associated with the Area of Significance, PSD increment , and NAAQS modeling. This information is needed to understand the modeling results presented in the application.

6. Other Emission Sources - The emission sources used for both the NAAQS and PSD compliance modeling were selected based on the 20D rule. This rule, which is not a guideline procedure, does not consider the additive effects of a number sources located in the same general location. Review of the 20D rule eliminated emission sources reveals afew NOx and many PM10 sources that may need to be included in the impact modeling emission inventories.

7. Facility Plot Plan - A plot plan displaying the location and dimensions of the various plant components and the site boundary is needed to determine and understand the input variables used in the modeling.

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I plan on discussing the above initial review comments with Cleve Holladay of FL DEP. Cmmnt01.dft
Please let me know if you have any questions or need further information on my initial review of this application.

DRAFT COMMENTS - FOR YOUR INFORMATION ONLY

Joseph,

Based on a preliminary review of the application information submitted thus far, I have the following draft comments:

NOx emissions

1. The applicant should provide a detailed explanation regarding whether or not a kiln NOx emission rate limit of 2.8 lb/ton clinker is feasible at startup. A review of the RBLC listings for two other dry process kilns located in Florida indicate that both Florida Rock Industries and Florida Crushed Stone are presently operating kilns with the reduced NOx emission rate limit (2.8 lb/ton clinker). It appears that final permits for both of the above facilities were issued more than two years ago. Detailed particulate matter, SO2, NOx, CO, and VOC emission rate calculations, including all references and assumptions, should also be provided. Detailed cost effectiveness/economic calculations for each of the add-on control options discussed in Section 3.13 (e.g., low-NOx burners, SCR, and SNCR), including all references and assumptions, should be provided by Suwannee American Cement. Discussions with Florida DEP staff indicate that an SNCR add-on NOx emission control system is available from the kiln vendor. A detailed discussion of the kiln vendor's SNCR system regarding both technical/economic feasibility should be included in Suwannee American Cement's BACT review for cement kiln NOx emissions. The applicant proposes a NOx emission rate limit of 3.8 lb/ton clinker as BACT for the cement kiln.

CO emissions

2. A review of RBLC listings reveals that lower cement kiln CO emission rate limits have recently been determined BACT for several other similar Portland cement plants. A discussion of why a reduced kiln CO emission rate limit would not be proposed as BACT by the applicant, should be included in the submittal. A technical and economic analysis regarding the feasibility of a 1.64 lb/ton clinker (LaFarge Corporation, Sugar Creek, Missouri, Permit No. 0897-019, issued August 20, 1997) kiln CO emission rate limit should be included in Suwannee's submittal. A CO emission rate limit of 2.77 lb/ton clinker has also recently (June 3,1998) been determined BACT for dry process kiln operations at Signal Mountain Cement Company located at Chattanooga, Tennessee. BACT analysis related information regarding the Signal Mountain Cement Company kiln CO emission rate limit was faxed to Florida DEP on December 18, 1998. The applicant proposes a CO emission rate limit of 3.6 lb/ton clinker as BACT for the cement kiln.

SO2 emissions

3. A technical and economic analysis regarding the feasibility of a reduced cement kiln SO2 emission rate limit (0.27lb/ton clinker) should also be included in the applicant's BACT review. The applicant proposes an SO2 emission rate limit of 0.28 lb/ton clinker for the new cement kiln.

Modeling/Monitoring: (draft comments are attached per Stan Krivo)

If you have any questions, please contact Stan Krivo or myself. If there are any questions regarding the applicability of 40 CFR Part 63, Subpart LLL (Portland Cement Manufacturing Industry), please contact Lee Page at (404)562-9131. I hope these draft comments are helpful.

Stan Kukier
EPA-Region 4

U.S.FISH&WILDLIFE SERVICE
AIR QUALITY BRANCH
P.O. BOX 25287, Denver, CO 80225-0287

FACSIMILE COVER SHEET

Date: December 18, 1998

Telephone: (303) 969-2617
Fax: (303) 969-2822

To: Cleve Holladay

From: Ellen Porter

Subject: Suwannee Cement; signed letter will follow

Number of Pages: 6
(Including this cover sheet)

Re: PSD-FL-259

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Our Air Quality Branch has reviewed the Prevention of Significant Deterioration Application for Suwannee Cement Company's proposal to construct a new cement plant in Branford, Florida. The facility is located 83 km southwest of Okefenokee Wilderness and 88 km north of Chassahowitzka Wilderness, both Class I air quality areas administered by the U.S. Fish and Wildlife Service. The technical review comments from our Air Quality Branch are enclosed. Specifically, we recommend that your department require Suwannee to re-evaluate its proposed control technology for nitrogen oxides emissions. Also, we ask that Suwannee be required to evaluate potential impacts from the new emissions to regional haze at the two Class I areas.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have questions, please contact Ellen Porter of our Air Quality Branch in Denver at (303) 969-2617.

Sincerely,

Sam D. Hamilton
Regional Director

Enclosures

cc: Doug Neeley, Chief
Air and Radiation Branch
U.S. EPA, Region IV
100 Alabama St., SW
Atlanta, Georgia 30303

bcc: FWS-REG. 4: AQC
OKEF: Refuge Manager
CHAS: Refuge Manager
AQD-DEN: Ellen Porter
National Park Service - AIR
P.O. Box 25287
Denver, CO 80225

Technical Review of Prevention of Significant Deterioration Permit Application
For a New Cement Plant
Suwannee American Cement Company
Branford, Florida
PSD-FL-259

by

Air Quality Branch, Fish and Wildlife Service – Denver
December 15, 1998

Suwannee American Cement Company (Suwannee) is proposing to construct a new cement plant in Branford, Suwannee County, Florida. The cement plant will be a dry process preheater/precalciner kiln, producing 2,300 tons per day of clinker, and up to 1,191,360 tons per year of various types and grades of Portland cement. The primary fuels will be coal and petroleum coke. Natural gas will be used as a startup fuel and supplemental fuel. Whole tires and/or tire-derived fuel will be used as a supplemental fuel. The facility is located 83 km southwest of Okefenokee Wilderness and 88 km north of Chassahowitzka Wilderness, both Class I air quality areas administered by the U.S. Fish and Wildlife Service (FWS). This project will result in PSD-significant increases in emissions of nitrogen oxides (NO_X), sulfur dioxide (SO_2), volatile organic compounds (VOC), particulate matter (PM), fine particulate matter less than 10 microns in diameter (PM-10), and carbon monoxide (CO). Emissions (in tons per year – TPY) are summarized below.

POLLUTANT	EMISSIONS INCREASE (TPY)
NO_X	1175
SO2	118
VOC	50
PM	267
PM-10	228
CO	1511

All significant PM and PM-10 emission points will be controlled by baghouses, and kiln SO_2 emissions will be controlled by the alkaline dust captured by the baghouse. NO_x is to be controlled by indirect heating.

Best Available Control Technology (BACT) Analysis

With the exception of NO_x, controls proposed for all emissions appear to represent BACT. The BACT analysis for NO_x is deficient in that it dismisses the application of Selective Non-Catalytic Reduction (SNCR) on the basis of adverse economic and environmental impacts. Suwannee estimates that NO_x removal would cost $1216/ton and states that "costs for NO_x removal using SNCR or any add-on controls are disproportionately high when compared to the costs of controls for NO_x emissions from other cement plants in recent BACT determinations." However, Suwannee does not provide any calculations or documentation to support the

$1216/ton removal cost at the proposed facility, or any comparative costs at other plants, including the Great Star Cement plant in Nevada where SNCR is required by a permit. For other industrial processes, NO_x control is typically $4000/ton; $1216/ton does not seem excessive.

Suwannee states that the availability of SNCR, and therefore its technical feasibility, is questionable because the RACT/BACT/LAER Clearinghouse record for the Great Star Cement plant is over two years old. In fact, construction has not begun on the plant. However, the EPA New Source Review Workshop Manual (Manual) provides guidance on "availability:"

> Two key concepts are important in determining whether an undemonstrated technology is feasible: "availability" and "applicability." As explained in more detail below, a technology is considered "available" if it can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term. An available technology is "applicable" if it can reasonably be installed and operated on the source type under consideration. A technology that is available and applicable is technically feasible.

Obviously, SNCR is an available technology as it is in use in numerous applications around the world, and is to be applied to the Great Star Cement plant if it is ever built. As for "applicability," the Manual states:

> Commercial availability by itself, however, is not necessarily sufficient basis for concluding a technology to be applicable and therefore technically feasible. Technical feasibility, as determined in Step 2, also means a control option may reasonably be deployed on or "applicable" to the source type under consideration.
>
> Technical judgment on the part of the applicant and the review authority is to be exercised in determining whether a control alternative is applicable to the source type under consideration. In general, a commercially available control option will be presumed applicable if it has been or is soon to be deployed (e.g., is specified in a permit) on the same or a similar source type.

Because SNCR is available and has been "specified in a permit" issued to a similar facility in Nevada, it must be considered technically feasible for Suwannee.

Finally, Suwannee notes that the ammonia used in SNCR presents a risk of environmental degradation. However, ammonia is routinely used in SNCR, SCR, and other industrial process at countless locations everyday and should not constitute a reason for rejection of SNCR merely because of its nature and presence. It is widely recognized that, with proper operation and maintenance procedures, ammonia can be handled and stored safely.

Conclusions & Recommendations

Suwannee should re-evaluate the feasibility of applying SNCR to control NO_x emissions from its proposed cement kiln. Suwannee has incorrectly rejected SNCR by questioning its availability, by failing to document and compare estimated control costs, and by overstating environmental risks associated with the use of ammonia. Suwannee should provide well-documented costs for application of SNCR as well as a comparison to the costs of applying SNCR to the similar Great Star Cement facility.

Air Quality Related Values (AQRV) Analysis

Suwannee did not perform visibility analyses to evaluate potential impacts to regional haze at Okefenokee or Chassahowitzka wildernesses. Suwannee incorrectly concluded that because predicted impacts to the Class I increments were less than significant, no air quality related values (AQRV) analyses were required. However, increment analyses are independent of AQRV analyses; Class I increments were never intended to protect Class I AQRVs. Therefore, Suwannee should perform regional haze analyses, following the recommendations of the Interagency Workgroup on Air Quality Modeling at: http://www.epa.gov/scram001/; "Model Support"; "6th Modeling Conference"; "IWAQM".

Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY - REGION 4
AIR, PESTICIDES & TOXICS MANAGEMENT DIVISION
AIR & RADIATION TECHNOLOGY BRANCH
100 Alabama Street, SW
Atlanta, Georgia 30303
Fax Number: 404/562-9095

FACSIMILE TRANSMISSION SHEET

DATE: 12/18/98	NUMBER OF PAGES (including this sheet): 6
TO: Joseph Kahn	PHONE: 850/921-9519
ADDRESS: FDEP	FAX NUMBER: 850/922-6979
FROM: Stan Kukier	PHONE: 404/562-9140

Please call me if this transmission is received poorly.

SPECIAL INSTRUCTIONS: FYI

re: Dry Process Cement Kiln - Technical BACT related info

Hope this is useful

Stan

Pages 5 + 6 were redundant. This is something like Rinker project where applicant netted out going from wet to dry. al

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-8909

APR 2 2 1998

4APT-ARB

Mr. Robert H. Colby
Director
Chattanooga-Hamilton County Air
Pollution Control Bureau
3511 Rossville Boulevard
Chattanooga, TN 37407

SUBJ: Draft PSD Permits for Signal Mountain Cement Company, Chattanooga, Tennessee (PSD-TN-154)

Dear Mr. Colby:

Thank you for your letter of March 20, 1998, submitting a preliminary determination and draft Prevention of Significant Deterioration (PSD) permits for the above referenced facility. The draft permits are for an expansion/major modification to the existing portland cement manufacturing facility. The project will consist of the replacement of two existing wet-process kilns with one dry-process kiln and modifications to the raw material handling, processing, and storage equipment. A new finish grinding system will also be added to supplement the existing finish mills.

Based on our review of the draft permits and supporting information, we have the following comments.

1. The project is subject to PSD permitting requirements due to a significant increase in CO emissions. The best available control technology (BACT) for CO emissions from the new kiln is the use of proper design and operation to achieve a CO emission limit of 248 lb/hr. Since this CO emission limit is based on an emission rate of 2.77 lb/ton clinker and the BACT emission limits for this source category are typically reported in units of "lb CO/ton clinker," we suggest that the permit for Signal Mountain Cement Company also include the CO limit of 2.77 lb/ton clinker.

2. Although each draft permit includes a condition indicating that all of the emission limits are BACT, the only emission limit which was determined by going through the BACT review process, as required by the PSD regulations, is the limit for CO. We recommend that this condition be

removed from each draft permit, since it is misleading. Since the project will result in either a net decrease or an insignificant increase in emissions of other pollutants (i.e., particulate matter, NO_x, SO_2, and volatile organic compounds), a BACT analysis was not required for those pollutants and was not included in the PSD permit application.

3. Each permit includes a condition indicating that the limitations of the permit may be modified, based on the required stack tests (or based on the final design of emission control equipment), "provided the adjusted limits do not exceed emission netting requirements..." For clarity, we recommend a modification in this clause. Instead, the following language may be preferable - "provided the adjusted limits do not result in a net emissions increase greater than the PSD significance levels..." Also, since the project will result in a significant increase in CO emissions and the emission limit for CO is based on the applicant's BACT analysis, the permit should not allow the CO emission limit to be increased.

4. Although the application for the kiln bypass and cement kiln dust (CKD) handling facility indicates that baghouses 15, 16, and 17 control emissions from these units, the permit only limits particulate matter emissions from baghouses 16 and 17. Please check to ensure that all emission points affected by the project are covered in the permits.

The requirements of 40 CFR Part 60, Subpart F (Standards of Performance for Portland Cement Plants) are applicable to the facility. Also, on March 24, 1998, 40 CFR Part 63, Subpart LLL - National Emission Standards for Hazardous Air Pollutants; Proposed Standards for Hazardous Air Pollutants Emissions for the Portland Cement Manufacturing Industry was published in the Federal Register. When finalized, this regulation will apply to each new and existing portland cement plant.

Thank you for the opportunity to review and comment on draft permits and supporting information. If you have any questions, please contact Keith Goff of my staff at (404)562-9137.

Sincerely yours,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides, and Toxics Management Division

RECEIVED 12/18/98
DISTRICT DIRECTORS MEETING

ECONOMIC INFORMATION

SELECTED FLORIDA COUNTIES WITH FIRST MAGNITUDE* SPRINGS

Suwannee County: Ichetucknee Springs

Unemployment Rate:	9.0%
Tourism & Recreation Tax Revenues:	$38.08 per capita
Percent of 10th Grade Students Passing the State Student Assessment Test:	78.5%

Citrus County: Homosassa Springs

Unemployment Rate:	8.5%
Tourism & Recreation Tax Revenues:	$59.74 per person
Percent of 10th Grade Students Passing the State Student Assessment Test:	96.5%

Hernando County: Weeki Wachee Springs

Unemployment Rate:	8.2%
Tourism & Recreation Tax Revenues:	$44.99 per person
Percent of 10th Grade Students Passing the State Student Assessment Test:	81.0%

Marion County: Silver Springs

Unemployment Rate:	8.6%
Tourism & Recreation Tax Revenues:	$73.45 per person
Percent of 10th Grade Students Passing the State Student Assessment Test:	81.5%

Wakulla County: Wakulla Springs

Unemployment Rate:	6.0%
Tourism & Recreation Tax Revenues:	$48.43 per person
Percent of 10th Grade Students Passing the State Student Assessment Test:	85.5%

*First magnitude springs discharge more than 64 million gallons of water per day.

SUMMARY

These other counties all have better economic indicators than Suwannee County:

- Lower unemployment rates
- Higher revenues, per person, from tourism and recreation
- Higher passing rates on the State Student Achievement Test

This information shows that industrial development, environmental protection, and tourism and recreation are all necessary for good economic development. The attached pages show large industrial and utility facilities located within 20 miles of these other springs.

Reference: Florida County Comparisons, 1992. Florida Department of Commerce.
Florida Department of Environmental Protection: Title V Facility Inventory, 1997.

CERTAIN SPRINGS in FLORIDA
and
NEARBY INDUSTRIAL FACILITIES
(within 20 miles)

Silver Springs
Marion County

Lead furnace, charcoal manufacturing, gas compressors, other industrial

Owner/Company	Process Description	Stack Ht (ft)	Distance from spring km	miles
GRIMES AEROSPACE COMPANY	SMALL METAL PARTS MANUFACTURING		5.62	3.5
GRIMES AEROSPACE COMPANY	STEAM BOILER		5.62	3.5
DAYCO PRODUCTS INC	#1 RUBBER COMPOUND MIXER W/BAGHOUSE	12	7.32	4.6
DAYCO PRODUCTS INC	HOSE CURE PREPARATION PROCESS W/BAGHOUSE	24	7.32	4.6
DAYCO PRODUCTS INC	LEAD EXTRUDER #3 AND 10 TON LEARD POT FURNACE	17	7.32	4.6
PREMDOR AKA JOHNSON DOOR PRODUCTS	DRYING OVEN	26	9.60	6.0
PREMDOR AKA JOHNSON DOOR PRODUCTS	BAKING OVEN	25	9.60	6.0
ROYAL OAK ENTERPRISES	NICHOLS HERRESHOFF RETORT CARBONIZER	40	10.17	6.3
ROYAL OAK ENTERPRISES	BRIQUETE PRES ROOM & DRYER	10	10.17	6.3
LOCKHEED MARTIN ELECTRONICS	PLATING ROOM	29	15.20	9.4
LOCKHEED MARTIN ELECTRONICS	ETCHER/STRIPPER ROOM	26	15.20	9.4
LOCKHEED MARTIN ELECTRONICS	TWO PLASMA ETCH MACHINES	25	15.20	9.4
LOCKHEED MARTIN ELECTRONICS	HOT WATER BOILER	20	15.20	9.4
LOCKHEED MARTIN ELECTRONICS	AIR STRIPPER #3 & 4	25	15.20	9.4
MARK III INDUSTRIES	UV REACTOR ROOM: 3 COATING SPRAY BOOTHS WITH LINE CONVEYORS	20	20.11	12.5
MARK III INDUSTRIES	18 IDENTICAL PAINT SPRAY BOOTHS (#1-#18);	30	20.11	12.5
FLORIDA GAS TRANSMISSION CO.	COMPRESSOR ENGINE NO. 1	28	22.93	14.3
FLORIDA GAS TRANSMISSION CO.	COMPRESSOR ENGINE #2	28	22.93	14.3
FLORIDA GAS TRANSMISSION CO.	COMPRESSOR ENGINE #3	28	22.93	14.3
FLORIDA GAS TRANSMISSION CO.	COMPRESSOR ENGINE #4	28	22.93	14.3
FLORIDA GAS TRANSMISSION CO.	RECIPROCATING I.C. ENGINE #5, 2400 BHP, NATURAL GAS FIRED	40	22.93	14.3

Wakulla Springs
Wakulla County

Power plant, other industrial

Owner/Company	Process Description	Stack Ht (ft)	Distance from spring km	miles
PRIMEX TECHNOLOGIES, INC.	NORTH SWEETIE BARREL (VENTURI SCRUBBER & 2ND STAGE PACKED CO	6	10.02	6.2
PRIMEX TECHNOLOGIES, INC.	NORTHEAST SWEETIE BARREL (VENTURI SCRUBBER & 2ND STAGE PACKE	6	10.02	6.2
PRIMEX TECHNOLOGIES, INC.	BOILER #1, CLEAVER-BROOKS	35	10.02	6.2
PRIMEX TECHNOLOGIES, INC.	BOILER #2, CLEAVER-BROOKS	35	10.02	6.2
TALLAHASSEE CITY PURDOM GENERATING STA.	BOILER PURDOM #5 FUEL OIL #6 & NAT GAS	125	13.31	8.3
TALLAHASSEE CITY PURDOM GENERATING STA.	BOILER PURDOM #6 FUEL OIL #6 & NAT GAS R	125	13.31	8.3
TALLAHASSEE CITY PURDOM GENERATING STA.	BOILER PURDOM #7 FUEL OIL #6 & NAT GAS	180	13.31	8.3
TALLAHASSEE CITY PURDOM GENERATING STA.	COMBUSTION TURBINE PURDOM UNIT #1-CT PEAKING UNIT	38	13.31	8.3
TALLAHASSEE CITY PURDOM GENERATING STA.	COMBUSTION TURBINE PURDOM UNIT #2-CT PEAKING UNIT	38	13.31	8.3
TALLAHASSEE CITY PURDOM GENERATING STA.	AUXILLARY BOILER	30	13.31	8.3
TALLAHASSEE CITY HOPKINS GENERATING STAT	BOILER HOPKINS #1 NAT GAS & FUEL OIL #6	200	25.68	16.0
TALLAHASSEE CITY HOPKINS GENERATING STAT	TURBINE HOPKINS UNIT #1	29	25.68	16.0
TALLAHASSEE CITY HOPKINS GENERATING STAT	COMBUSTION TURBINE HOPKINS #2 GT PEAKING UNIT	30	25.68	16.0
TALLAHASSEE CITY HOPKINS GENERATING STAT	UNIT #2	250	25.68	16.0
U.S. MARINE	STACK ID H- 18"X24" WOODSHOP/BAGHOUSE	12	31.34	19.5
U.S. MARINE	STACK ID - 2, 6" STACKS SPENCER VACUUMS	12	31.34	19.5

CERTAIN SPRINGS in FLORIDA
and
NEARBY INDUSTRIAL FACILITIES
(within 20 miles)

Homosassa Springs
Citrus County

2 Cement plants, 2 power plants, lime plant, other industrial

Owner/Company	Process Description	Stack Ht (ft)	Distance from spring km	miles
METAL INDUSTRIES, INC	PROPANE FIRED DRYING OVEN USED AFTER CLEANING & PRETREATMENT	25	11.15	6.9
FLORIDA POWER	STEAM UNIT #1 - 400MW	499	20.68	12.9
FLORIDA POWER	UNIT #2, 500 MW COAL FIRED STEAM GENERATOR WITH ESP	503	20.68	12.9
FLORIDA POWER	CRYSTAL RIVER UNIT #5 ******POWER PLANT SITING******	600	20.68	12.9
FLORIDA POWER	CRYSTAL RIVER UNIT #4 ******POWER PLANT SITING******	600	20.68	12.9
FLORIDA POWER	THREE 820 KW DIESEL GENERATORS.	15	20.68	12.9
SOUTHDOWN, INC.	CEMENT KILN NO. 1 BAGHOUSE(E-55);REVISED OIL CONCENTRATIONS	150	20.79	12.9
SOUTHDOWN, INC.	CEMENT KILN NO. 2 BAGHOUSE(E-19); REVISED OIL CONCENTRATIONS	105	20.79	12.9
CHEMICAL LIME INC. (SEE COMMENT)	LIME HYDRATOR	20	28.42	17.7
FLORIDA CRUSHED STONE CO., INC.	KILN, CLINKER COOLER, RAW MILL, AND DRYER W/BAGHOUSE	300	28.56	17.7
CENTRAL POWER & LIME, INC.	POWER PLANT	320	28.56	17.7

Weeki Wachee Springs
Hernando County

2 Cement plants, municipal waste-fired power plant, coal-fired power plant, other industrial

Owner/Company	Process Description	Stack Ht (ft)	Distance from spring km	miles
CHEMICAL LIME INC. (SEE COMMENT)	LIME HYDRATOR	20	15.07	9.4
FLORIDA CRUSHED STONE CO., INC.	KILN, CLINKER COOLER, RAW MILL, AND DRYER W/BAGHOUSE	300	15.69	9.8
CENTRAL POWER & LIME, INC.	POWER PLANT	320	15.69	9.8
PASCO COUNTY (OWNER)	#1 MUNICIPAL WASTE COMBUSTOR, (HAS PSD)	275	16.80	10.4
PASCO COUNTY (OWNER)	#2 MUNICIPAL WASTE COMBUSTOR,(HAS PSD)	275	16.80	10.4
PASCO COUNTY (OWNER)	#3 MUNICIPAL WASTE COMBUSTOR, (HAS PSD)	275	16.80	10.4
SOUTHDOWN, INC.	CEMENT KILN NO. 1 BAGHOUSE(E-55);REVISED OIL CONCENTRATIONS	150	16.93	10.5
SOUTHDOWN, INC.	CEMENT KILN NO. 2 BAGHOUSE(E-19); REVISED OIL CONCENTRATIONS	105	16.93	10.5
CITRUS SERVICE, INC.	600 HP CLEAVER BROOKS, MOD. CB420, NO. 6 OIL, NO CONTROLS	34	18.40	11.4
CITRUS SERVICE, INC.	CITRUS PEEL DRYER W/WASTE HEAT EVAPORATOR	60	18.40	11.4
CITRUS SERVICE, INC.	JOHNSON 150 HP PROCESS STEAM BOILER (BOILER NO. 2)		18.40	11.4

Florida Department of Environmental Protection

Meeting Sign-In Sheet

Re: SUWANEE AMERICAN CEMENT   Date: 12-17-98

Name	Representing	Telephone
CINDY PHILLIPS	FDEP - AIR TOXICS PERMITTING	850-921-9534
Lennon Anderson	" " "	850 921-9588
Steve Cullen	Suwannee American Cement	352 377-5822
MARK MUELLER	KRUPP POLYSIUS CORP.	770-980-5029
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MARK TERRY	KRUPP POLYSIUS	770 980 5013
FRANK DARABI	DARABI & Assoc.	352/276-6533
	Suwan Ameri Cem	
Al Linero	FDEP - Bureau of Air Regulation	850/921-9523
JOE KAHN	DEP - BAR/NSR	850-921-9519
C H Fancy	" " "	9219503

MARK S. TERRY
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Directors of District Management Meeting
December 18, 1998
8:30

<u>CARR BUILDING, ROOM 154</u>

Progress of SLERP Process Mapping - District Directors

"Public" vs. "private" easement determinations - Phil Coram, Gary Heiser

Data quality and lab. certification / role of district labs - Bill Coppenger

→ Proposed cement manufacturing plant - Howard Rhodes, Frank Darabi

Intergovernmental Issues - Deb Parrish
- Gov's Task Force on Cumulative and Secondary Impacts
- Int. Trade / Seaport Expansions / Freight Task Force
- Transportation and Land Use Study Committee
- State Comprehensive Plan Review Process

Data access issues

EMRTF penalty dollars - Jacki McGorty

Happy Holidays

[illegible]OMBUSTION, HE[illegible] TRANSFER AND NO[illegible]

[illegible] Mullinger and B G Jenkins, Fuel and Combustion [illegible]

[illegible] of combustion optimisation in, and NOx emission characte[illegible]

FOR THE SPANISH TRANSLATION, PLEASE REFER TO THE SPECIAL SECTION AT THE [illegible]

Abstract

Guesswork, simple calculations combined with the extrapolation of experience, and system modelling can all be used to design combustion systems for rotary kilns. While the sole use of guesswork is rare, simple calculations and extrapolation are still the standard method, despite the availability of proven modelling techniques. This paper provides a brief background to combustion, heat transfer and NOx formation in rotary kilns and demonstrates how these modelling techniques, a detailed knowledge of the interaction of the combustion process with the process itself, and consideration of NOx formation chemistry, can be successfully applied to rotary kilns particularly with regard to the conversion of kilns from solid fuels to gas firing, product quality improvements, and waste and multiple fuel firing. Any one modelling technique can give only part of the answer and several methods have to be used to provide reliable answers for real industrial problems. A number of major benefits can be realised through this approach, including reduced costs and increased profits for the kiln operator with reduced environmental impact. Much future emphasis will be directed towards NOx reduction whilst maintaining and improving predictability and product quality.

Introduction

Rotary kilns are used for the processing and production of many materials in industry. Typical examples are cement clinker, lime, alumina, calcination of petroleum coke, and many other ore beneficiation processes. Clearly, there are similarities between all rotary kilns; they are all cylindrical, rotate at between 0.5 and 2 rpm and are generally fired by a single flame. However, here the similarity ends. Kiln configurations are process dependent, the required process temperatures vary widely, and secondary air temperatures are highly variable, as is the type of firing system employed. In addition, a wide range of fuel types are typically fired.

As previously mentioned, rotary kilns are used across a broad range of process industries, but by far the largest user is the cement industry, which operates approximately 2000 cement rotary kilns worldwide. Consequently, this paper is principally concerned with the cement rotary kiln but the general approach to resolving combustion problems and improving process efficiency, and the consideration of the complex interaction between the combustion process and the process itself, is applicable across the range of processes employing the rotary kiln technology.

Optimisation of both the energy consumption and process efficiency of cement kilns involves both fossil fuel and electrical energy, and this paper is principally concerned with the former. Optimisation encompasses minimising fuel consumption, unburnts, NOx, SO_2 and cement linker grinding energy.

Cement clinker with small crystals and sharp boundaries assists easy grinding and gives the cement a high early strength. Crystal growth is strongly influenced by the heat transfer from the flame, favourable conditions being the rapid heating from calcining temperature to sintering temperature, and the sudden quench in the cooler to freeze the crystal structure. These conditions are produced by a flame with a high heat flux close to the burner nozzle. Flames with very flat heat flux profiles provide slow rates of heating and large crystals. The resultant clinker is hard to grind and produces cement with poor early strength. To compensate and meet market requirements, the raw mix is sometimes adjusted, the kiln burnt harder, and the cement ground finer, thus increasing the energy consumption both in the kiln and in the grinding mill. The difference in energy consumption in the kiln and grinding mill between clinker produced by an optimised flame and a poor flame can be as much as 10%. With energy being a major cost in cement manufacture (between 40-50% of production costs) a poor flame heat flux profile therefore imposes a high economic cost as well as a significant increase in atmospheric emissions.

The importance of the flame on the cement clinker manufacturing process was first recognised by Martin[1] in the late 1920s. A method of optimising the flame for an individual kiln was first developed by Moles and Jenkins[2] in the early 1970s. Early applications of this technique, dubbed Flame Control by Moles, were very successful[3]. These early techniques used empirical formula together with physical modelling. The advent of the PC in the early 1980s permitted heat transfer modelling to be included. Today, with the availability of much more powerful PCs, computational fluid dynamic modelling is also utilised.

This paper is concerned with the application of both physical and computer modelling techniques to the optimisation of combustion and heat transfer in commercial cement plants. The increasing use of these techniques leads to improved product quality, reduced fuel consumption and emissions, more stable kiln operation and improved refractory life. A section is also included on NOx and techniques to control NOx emissions.

Combustion & heat transfer modelling

Combustion and heat transfer are very complex subjects which are even today not readily amenable to rigorous mathematical analysis. Prediction of the performance of burners and combustion equipment and associated plant is therefore extremely difficult. There are essentially three choices for designing combustion and heat transfer systems:

- Guesswork.
- Simple calculations combined with the extrapolation of experience.
- Modelling of the system.

Fortunately the use of simple guesswork is probably quite rare but the majority of kiln burner systems are still designed using simple calculations with the extrapolation of experience. Since the secondary air provides most of the combustion air in cement kilns, its temperature, velocity and flow distribution has a significant effect on the performance of the burner. There are unique differences between kilns (even those of the same size and nominal design) in respect of cooler and hood, and hence secondary air temperature, velocity and flow distribution. This vital fact is largely ignored by most kiln builders and burner suppliers. It is little wonder therefore that kiln performance is often unsatisfactory, resulting in unstable operation, poor clinker quality, high fuel consumption and CO emissions, and poor refractory life.

Combustion in cement kilns

Combustion is defined as the oxidation of fuel to release heat. The objective of the combustion engineer and plant operator is to obtain a steady heat release at the required rate. The chemistry of the oxidation of hydrocarbon fuels is very complex but none of the reactions can take place until the oxygen in the air is brought into contact with the fuel. As a result, all combustion processes take place in the following stages:

- Mixing.
- Ignition.
- Chemical reaction.
- Dispersal of products.

The overall rate of combustion is dependent on the slowest of the above stages. In most industrial combustion systems, the mixing is slow whilst the other steps are very fast. The rate and completeness of the combustion process is therefore controlled by the rate and completeness of fuel/air mixing. Insufficient mixing produces unburnt CO in the flue gases, wasting fuel. For good combustion, it is necessary to ensure that adequate air is supplied and that the burner mixes the fuel and air streams effectively and efficiently, hence the combustion is controlled by the rate and completeness of the fuel/air mixing i.e. if it is mixed, it is burnt.

For kiln burners, fuel/air mixing occurs as a result of jet entrainment. Figure 1 shows a schematic of a fuel jet issuing from a burner nozzle in a rotary kiln. Momentum exchange occurs between the boundary of the jet (which is normally fuel and primary transport air) and its surroundings, causing the surrounding secondary air to be locally accelerated to the jet velocity. The accelerated air is then pulled into the jet, expanding it. This process is momentum controlled and continues until the velocity of the jet is the same as that of its surroundings. The greater the momentum of the jet, the more rapidly the surrounding secondary air is entrained into the fuel.

If the jet has momentum in excess of that required for the complete entrainment of the secondary air, recirculation will occur. A moderate degree of recirculation is a positive indication that fuel/air mixing is complete, whilst its absence is a clear indication that not all of the secondary air has been entrained into the fuel jet up to the point at which the fuel jet impinges on the kiln refractory wall. In the latter case, the production of significant levels of carbon monoxide is normal, and hot reducing gases will then be in direct contact with the coating and refractory, tending to 'wash' away the coating and causing subsequent brick failure. The recirculating gases from a high momentum flame, however, provide a 'cushion' of cooler neutral gases which prevents this direct impingement of the flame on the coating and refractory.

Since the secondary air must be entrained into the primary air and fuel jet, the secondary air flow patterns and temperature have a huge effect on the fuel/air mixing. The aerodynamics are determined by the design of the cooler and secondary air inlet system (hood) and as a result, the design of these items significantly affects the combustion in the kiln. Any effective modelling of the combustion process must take these factors fully into account.

For any given kiln, the flame length and heat transfer are determined by the fuel/air mixing rate and the quantity of excess air. Increasing either the

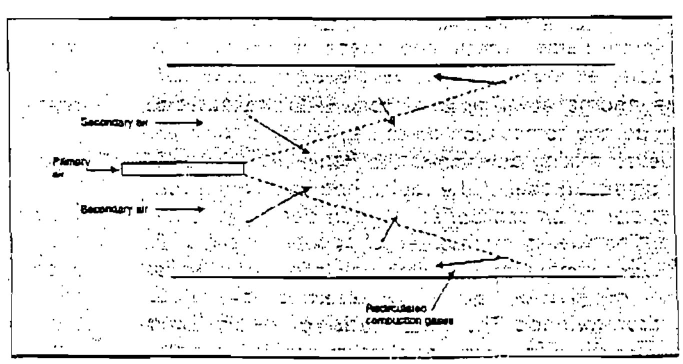

Figure 1. Entrainment and recirculation in a confined jet.

fuel/air mixing rates or excess air gives a shorter flame. The fuel/air mixing rate is dependent on the ratio of the momentum between the combined primary air and fuel jet and the momentum of the secondary air. Thus, the higher the velocity and mass flow of the primary air, the more rapid the fuel/air mixing.

Kiln operators will invariably run the kiln to provide the best product possible. If the fuel/air mixing is poor, the kiln has to be operated at a higher excess air to shorten the flame to give adequate heat transfer. Operating at a relatively high excess air is detrimental to the kiln thermal efficiency (Figure 2). This shows the relationship between the oxygen level and the measured daily heat consumption for a semi dry process cement kiln. Increasing the oxygen level in the kiln from 1% to 5% causes an increase in the heat consumption of more than 10%.

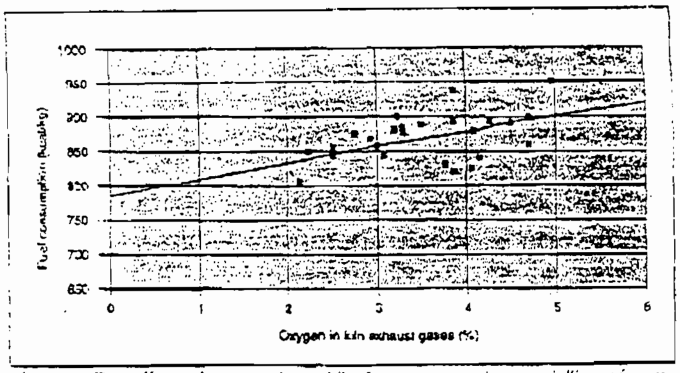

Figure 2. The effect of excess air on kiln fuel consumption modelling of combustion and heat transfer in cement kilns.

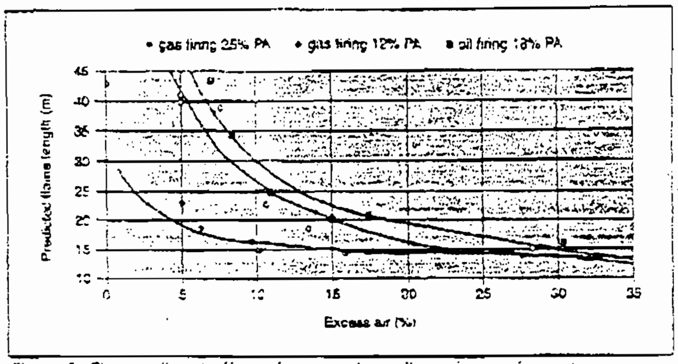

Figure 3. The predicted effect of excess air on flame length for various primary airflows.

To obtain the best potential performance from any kiln, it is absolutely essential that the flame is optimised to give the best product crystal structure at low excess air. This requires that the aerodynamic characteristics of the kiln are taken fully into account when designing the burner.

Effective modelling requires that the important parameters of the process being studied are identified and represented in the model. Since it is not possible to scale nature completely, physical modelling can only give part of the answer. Mathematical modelling is similarly limited both by computing power available and the ability to describe the combustion and heat transfer process mathematically. As a result, each modelling technique represents a partial understanding of the process. The objective is to provide predictive techniques which work for real flames in real kilns and contribute to improved kiln performance. To achieve this objective normally requires the use of several modelling techniques simultaneously.

Physical modelling of flames

Despite the growth in computer modelling, physical modelling is still the most effective method for determining flame length and shape in rotary kilns. Acid/alkali modelling was developed by Sir William Hawthorne[4] at MIT as long ago as 1938 and is used to model the combustion process in rotary kilns where fuel/air mixing determines the flame characteristics. A physical model of the cooler, hood and kiln is constructed to an appropriate scale in clear acrylic plastic. The fuel is represented by dilute caustic soda solution containing phenolphthalein indicator, whilst the combustion air is represented by dilute hydrochloric acid. The concentration of the alkali and the stoichiometric ratio of alkali to acid is chosen to represent the correct air/fuel air requirement for the particular fuel. The flow of acid is adjusted to simulate different excess air levels, hence determining the relationship between flame length and excess air. The phenolphthalein becomes colourless at the boundary where the mixing is complete, thus the model flame envelope is defined by the coloured region. The aerodynamics of the full size system are reproduced on the physical model thus allowing an accurate simulation of the fuel/air mixing characteristics and hence flame length under representative conditions.

These model results have to be corrected since the model is run under isothermal conditions; whilst in the kiln, considerable changes in temperature usually occur as combustion takes place. This results in a reduction in the gas density and an increase in volume giving a longer flame in the kiln than in the model. For most practical purposes the model flame length has only to be corrected for the density changes. When the corrections are applied to the model results, a series of curves of predicted flame length against excess air are produced (Figure 3).

Heat transfer modelling

The combustion process, and its integration into energy transfer equipment design, is the most complex of all process engineering problems, requiring the simultaneous solution of heat, mass and momentum transfer. For effective modelling of combustion and heat transfer in a rotary kiln many factors must be taken into account. Rotary kiln flames are turbulent jet diffusion flames which are fortunately relatively well understood owing to the work of Thring and Newby[5], Craya and Curtet[6], and Becker[7]. Their analysis of momentum transfer in free and confined jets has yielded theories to predict the macro-turbulent entrainment characteristics for both cold and hot systems. Mathematical modelling is used for a wide range of combustion and heat transfer processes including the burnout of oil, coal and coke particles, heat transfer and the residence time and concentrations of feed and product in the process.

For heat transfer modelling, the kiln is divided into axial slices, typically 100 mm thick, and the mixing rates, combustion heat release, and radiative effects of the gases and particles calculated within each slice to determine the radiant heat transfer to the product and walls. Convective heat transfer effects are also calculated within each slice. By stepping the calculation through the system, a realistic estimate of the burnout, gas temperature, heat transfer and product temperatures can be obtained. The flame itself and the combustion products absorb, and emit, thermal radiation. Both gases and particulate material present in the flame contribute to the absorbing propensity of the flame. Within the flame, the chemical effects of the combustion process are secondary, since the reaction time constants are orders of magnitude faster than the diffusional mixing constants. Thus, the combustion process can be reduced, with a 'mixed is burnt' assumption controlling the rate of heat release. The mathematical model used by FCTI for calculating the heat transfer from flames in rotary cement kilns takes these factors fully into account[8].

Computational fluid dynamic modelling

FCTI uses commercially available CFD software packages (Phoenics, CFDS Flow-3D, Fluent) as design tools for an increasing number of flow and combustion problems, particularly problems involving materials in suspension, such as feed in a rotary kiln precalciner and the incineration of sewage sludge in a vortex combustor. In simple terms, the calculation commences by sub-dividing the solution domain into cells, thus forming the computational grid. When the grid has been constructed, the fluid properties and boundary conditions are specified. Having specified the grid, the fluid properties and the boundary conditions, discretised versions of the Navier-Stokes partial-differential equations that govern the dynamics of fluid flow, are generated internally and solved by the applicable CFD solvers. More complex systems including two phase and combustion flows are also mathematically simulated.

NOx assessments

The NOx formation in kiln flames is generally by both thermal and fuel routes (for coal, oil and petroleum coke which contain fuel nitrogen). Owing to the very high flame temperatures which occur, usually above 2000 °C, thermal NOx is generally the dominant mechanism and typically accounts for circa 70% of the total NOx emission dependent on secondary air preheat temperature. In gas fired kilns, fuel NOx is absent so all the NOx is thermal NOx. However, it should be noted that the absence of fuel NOx in gas fired kilns does not necessarily lead to a reduction in NOx emissions, since gas flame temperatures are often higher than of coal or oil. Apart from temperature, the in-flame oxygen concentration and the residence time in the high temperature zones influence the final thermal NOx emissions.

The formation of NOx is complex and still not a well understood process, consequently modelling these of the NOx formation process is still very difficult. A number of the currently available models are capable of predicting the trends of NOx formation with change in flame conditions and fuel type, but accuracy is poor and sometimes little better than orders of magnitude. Currently, the most reliable methods of predicting NOx emissions from full scale flames is by empirical scale up from test flames.

FCTI has achieved good results using the data from the test work undertaken by The International Flame Research Foundation for the Cemflam 1 consortium[9] and the main results of this work are described below. In addition, for prediction of NOx in rotary kilns, FCTI utilises a customised and modified version of the Facsimile kinetic package produced by AEA Technology. The programme used by FCTI utilises the package to solve full combustion and NOx chemistry superimposed on a platform of a thermal and mixing field determined from FCTI's physical, heat transfer and CFD complementary modelling. These complementary modelling techniques allow acceptable NOx predictions to be made in any combusting environment. To date results have been encouraging, with predictions of NOx emissions from an existing coal fired 'dead burned' dolomite kiln being within 10% of measured values and predictions for a petroleum coke fired pre-cal-

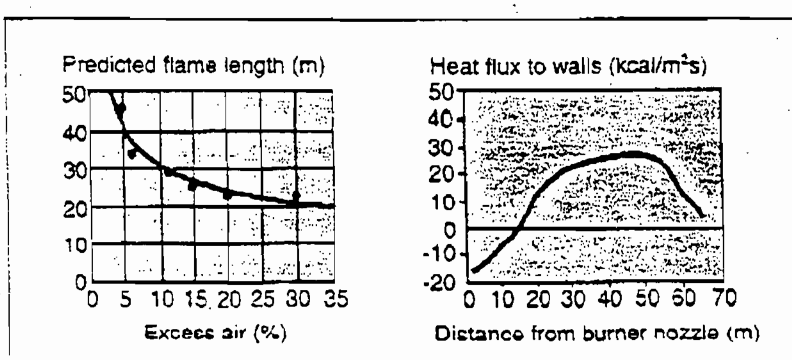

Figure 4. Flame lengths and heat flux profiles for existing combustion conditions (original burner 11% PA (cold). Left, effects of excess air on flame length; right, wall heat transfer prediction.

other being marginally high. Further validation of this programme over a broad range of combustion processes is currently in being undertaken by FCTI.

Validation of modelling

Although it is possible to produce a predictive method, it is difficult to ensure that its predictions are correct i.e., in agreement with experimental observations. Consequently, considerable effort has been made by FCTI to 'validate' these computer models. The method involves making detailed comparisons between predictions and experiments; to interpret whatever discrepancies are discovered in terms of computational inaccuracies, inadequacies of assumptions, and imprecisions of measurement; and then to implement improvements which result finally in the reduction of the discrepancies to acceptably-small values. To date, FCTI's computer models have been sufficiently validated for designers and operators of equipment to use reliably.

Application of modelling techniques to real kilns

Modelling can be used to solve problems with existing kilns, optimise the performance of existing kilns, assess the effect of fuel or other process changes in advance of the changes being made or optimise the design of new plant. FCT uses modelling for all these purposes. Typically more than one modelling technique is used for a particular application because each technique provides only part of the answer required. Within the kiln itself, acid/alkali modelling is used to simulate the combustion whilst the zone method of heat transfer is used to predict heat transfer from the flame to the product. For flash calciners, both techniques can be used together with CFD modelling of the particle trajectories and residence times.

The major benefits are reduced costs and increased profits for the kiln operator with reduced environmental impact. The former is attributable to reduced fuel consumption, improved refractory life, and shorter downtime, with potentially greater sales resulting from longer production runs and improved product quality. The reduced emissions are the result of reduced flue gas volumes and less unburnt fuel. A few examples are now described.

Kiln conversions to gas firing

FCTI first applied these techniques to lime kilns over ten years ago during the conversion of a lime kiln in Cheddar Gorge, UK, to gas firing. The first cement application came a year later with the conversion of Cockburn Cement's kilns in Western Australia to gas firing. Cockburn Cement operates three cement kilns and two rotary lime kilns. Four of the kilns at Cockburn Cement had originally been oil-fired and then converted to coal using a very difficult local coal. The coal firing systems were designed using Moles and Jenkin's Flame Control Techniques in 1981. The initial conversion to gas firing was undertaken using the traditional technique of simple calculations combined with the extrapolation of experience. Whilst these burners were satisfactory in the two smaller cement kilns, they presented serious problems with regard to product quality on the largest cement kiln and on one of the lime kilns. FCT was called in and asked to assist with identifying and resolving these problems and designing a burner for the second lime kiln. Acid/alkali modelling of the combustion and mathematical modelling of the heat transfer was undertaken for both kilns and new burners designed and successfully installed.

Product quality improvements

Adelaide Brighton Cement operated a gas fired preheater kiln rated at 2000 tpd using a high velocity gas burner without primary air. The plant management used the Ono method for assessing burning conditions in the kiln and this indicated a slow rate of heating of the charge. The kiln flame was modelled using the acid/alkali technique which confirmed a long slow mixing flame (Figure 4). Heat transfer modelling confirmed a flat heat flux profile consistent with large crystals and high proportion of glass phase.

Improving the heat flux profile by better fuel air mixing is a matter of increasing the burner jet momentum relative to the secondary air momentum. With the maximum gas velocity already in use this could only be achieved by adding some primary air to the burner, hence increasing the overall mass flux of the burner jet. To achieve the most suitable flame length and heat flux profile the flowrate and velocity of this primary air has to be optimised. This is essentially a trial and error technique with the equivalent of various primary air flows and velocities tried on the acid/alkali model. This is a time consuming business but much quicker than a similar trial and error exercise on the full size kiln! Once conditions are optimised, the heat transfer model is used to assess the heat flux profile. The modelling confirmed that improving the mixing by using some primary air would produce considerable benefits in terms of flame length excess air and heat flux profile (Figure 5). A suitable burner was designed and installed.

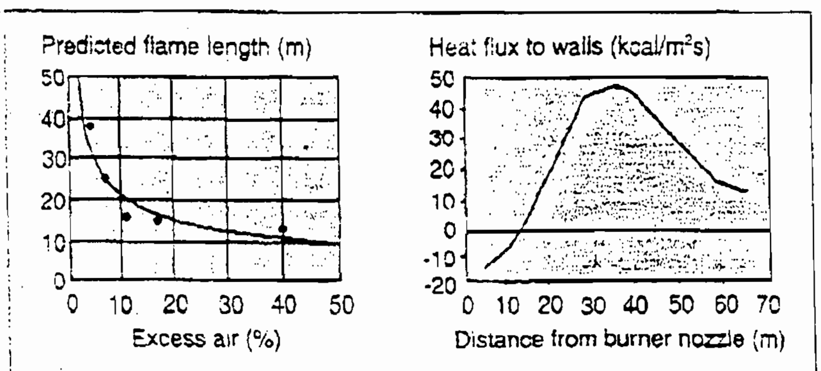

Figure 5. Flame lengths and heat flux profiles for optimised combustion conditions (optimised burner 7% PA (not), left, effects of excess air on flame length; right, wall heat transfer prediction

Following commissioning of the new burner, there were several significant improvements in kiln operation including improved stability, better coating and improved clinker quality. CO emissions and specific energy consumption were reduced and the clinker was also easier to grind.

Precalciner conversion modelling

Later this kiln was converted to a precalciner kiln and the new kiln process conditions modelled. Operation in precalciner mode requires lower primary air flowrates and velocities than preheater mode for optimum performance. Modelling also played an important role in the design of the calciner with acid/alkali modelling used to determine the optimum position for the burners. In more recent times CFD modelling has been used to study the particle trajectories, concentrations and residence times in flash calciners[10] and to optimise these by suitable adjustments to the feed inlet position and velocity. These techniques result in improved output for existing units.

Waste fuels and multiple fuels

The modelling techniques outlined above can cope with multiple fuel firing. Hence waste derived fuels can be effectively utilised with minimum disruption to both the kiln and environment by the use of modelling to ensure that the fuel/air mixing is excellent. This allows unburnts to be minimised whilst optimising the heat flux profile produced by the combination of waste and main fuel firing.

NOx formation in rotary kilns

The formation of NOx in flames is generally by both thermal and fuel routes (for coal, oil and petroleum coke and other fuels containing fuel bound nitrogen). The total NOx emission is always made up of contributions from both sources. The dominant source, however, is dependent on the amount of nitrogen contained in the fuel and the flame temperature with the latter being highly dependent on secondary air preheat temperature and the thermal requirement of the material being processed. Secondary air temperatures can vary from ambient in the case of petroleum coke calcination to in excess of 1100 °C for the production of cement clinker. Dependent on the process, reactions can be exothermic of endothermic or the process may merely require the material in the kiln to be heated to a pre-specified temperature. If NOx emissions are an issue for a particular process, the dominant source of NOx in the flue gases must be identified if the appropriate NOx reduction technology is to be employed to facilitate its reduction without compromising the process thermal requirements. In the cement industry specifically, with the kiln fired with solid or liquid fuels, very high flame temperatures occur. i.e. above 2200 °C, and thermal NOx is generally the dominant mechanism accounting for between 60 and 70 % of the total NOx appearing in the flue gases.

In gas-fired plant, by contrast, fuel NOx is absent so all the NOx is thermal NOx. However, it should be noted that the absence of fuel NOx in gas fired plant does not necessarily lead to a reduction in NOx emissions, since flame temperatures are often higher.

NOx formation mechanisms

Thermal NOx is formed by the combination of atmospheric nitrogen and oxygen at very high temperatures. The high temperatures are required because of the high activation energy of the reaction, due particularly to the energy required to break the bond in the nitrogen molecule. The reaction is therefore highly temperature dependent. The reaction takes place between oxygen radicals, nitrogen radicals and molecular nitrogen and oxygen in the Zeldovich reaction couple. Apart from temperature, the in-flame oxygen concentration and the residence time in the high temperature zones influence the final thermal NOx emissions.

Most fuels, other than gas, contain nitrogen bound as organic compounds in the fuel structure. When the fuel is burnt, this organic nitrogen becomes converted into a range of cyanide and amine species which are subsequently oxidised to NOx, depending on the local oxygen availability, but this mechanism is less dependent on temperature.

A third mechanism of NOx formation has been identified by some workers which involves the fixation of nitrogen by hydrocarbon compounds in fuel rich areas of the flame. This mechanism is known as prompt NOx. The formation mechanisms of prompt NOx, thermal NOx and fuel NOx are described in more detail below.

Thermal NOx

The common approach for explaining the formation of thermal NOx is to base the theory on two basic Zeldovich reactions:

$$O + N_2 \frac{k1f}{k1b} = NO + N$$

$$N + O_2 \frac{k2f}{k2b} = NO + O$$

Klf is strongly dependent on the local temperature. N_2 and O_2 are traditionally set to the equilibrium conditions at the prevailing temperature but in coal flames the temperatures are probably too low for this equilibrium assumption to be valid for N_2 and it is virtually impossible to measure O using currently available techniques.

The above is a limited and greatly simplified approach to the theory of thermal NOx formation and is included to allow an appreciation of the complexity of the theory and the difficulty of making theoretical predictions of thermal NOx emissions. Figure 6 shows the extreme temperature dependence of thermal NOx formation.

Fuel NOx

Fuel NOx is generally associated with coal or petroleum coke combustion which contain nitrogen chemically bound within their structures, and to a lesser extent with oil. Most studies on fuel derived NOx have been performed on coal and the main focus of this section is related to fuel NOx derived from coal combustion. The mechanisms by which NOx is formed from the chemically bound nitrogen in coal is extremely complex, even the structure of the nitrogen in the coal is subject to considerable conjecture. The nitrogen is believed to be in the form of pyridine, pyrrol and amine type structures (Figure 7). The actual structure in any coal or oil is believed to be strongly dependent on coal type or the origin of the oil. The predominant forms of nitrogen in most coals are the pyrrolic and pyridine forms and that the former tends to decrease with increasing coal rank. However, at present, the importance of the structure of the nitrogen in the coal on the final NOx emissions is not well established.

When coal is burnt in suspension, as in rotary kilns, it is heated very rapidly to high temperatures and pyrolysis occurs, producing solid and gaseous products. The nitrogen present will divide between these with typically 20% of the nitrogen in the char and 80% in the gaseous phase, the latter both as the light fractions and tars. For any coal, the distribution of nitrogen between the gaseous phase and char is heavily dependent on the conditions in the flame such as heating rate, peak temperature, and residence time at high temperature.

A simplified NOx formation path is shown in Figure 8. Most of the gaseous nitrogen pyrolyses either directly or indirectly to HCN. This complex process is not instantaneous but dependent on the conditions in the flame. The HCN then oxidises to NO (Figure 9) with this reaction being both temperature and time dependent (Figure 10).

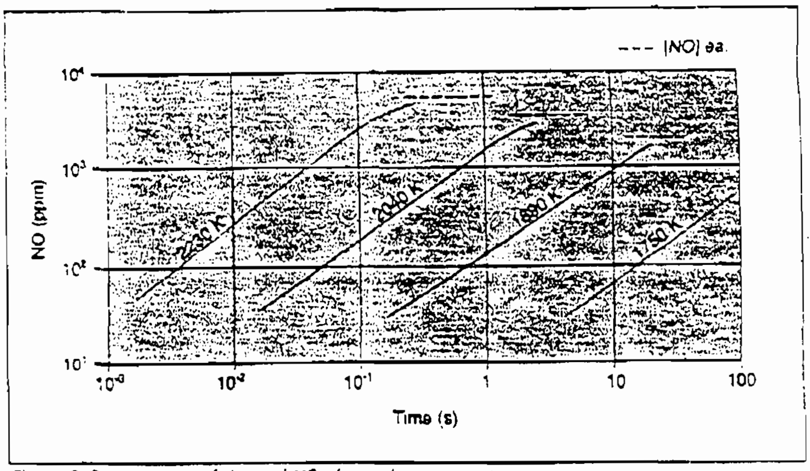

Figure 6. Dependence of thermal NOx formation rate on temperature.

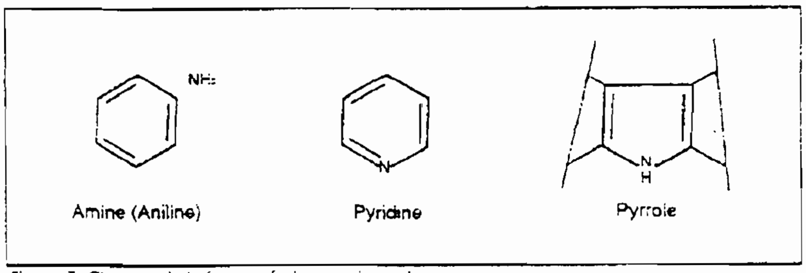

Figure 7. Characteristic forms of nitrogen in coal.

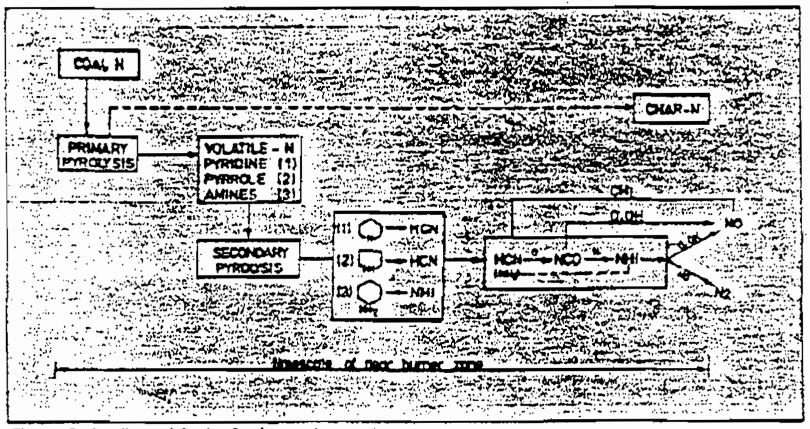

Figure 8. Outline of fuel NOx formation path.

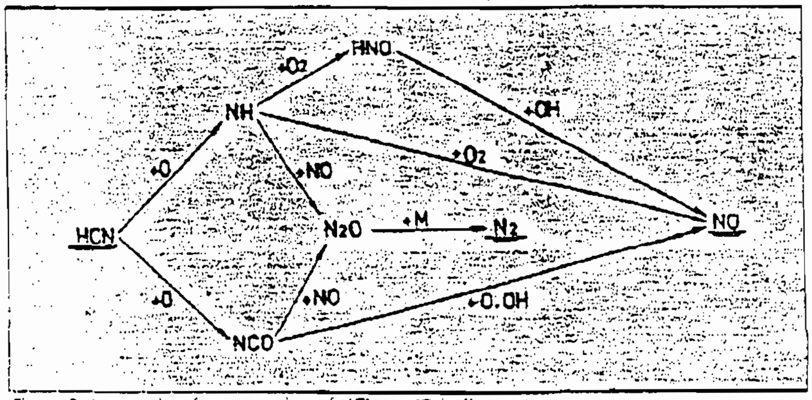

Figure 9. Mechanism for conversion of HCN to NO in flames

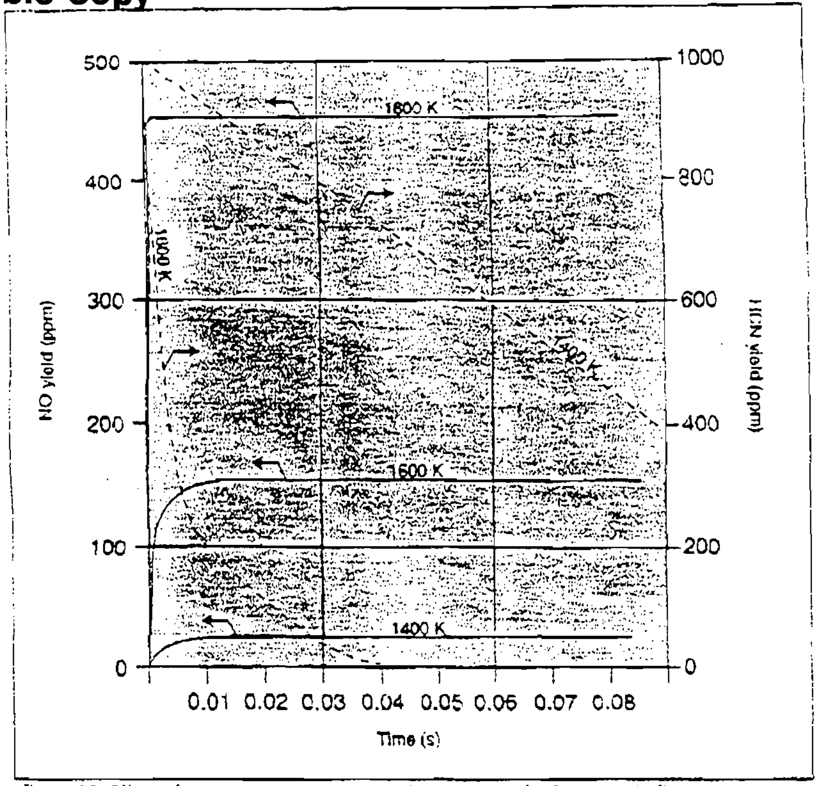

Figure 10. Effect of temperature on the rate of conversion of HCN to NO in flames.

Prompt NO

In low temperature, fuel rich flame zones, NO is found to form more rapidly than predicted from considerations of the thermal NO mechanism. The difference is due to the so called 'Prompt NO' formation mechanism. Prompt NO is formed by the rapid fixation of atmospheric nitrogen by hydrocarbon fragments. The following reactions are formed:

$$CH + N_2 = HCN + N$$

$$C + N_2 = CN + N$$

NO is subsequently formed from the oxidation of the nitrogen atom:

$$N + O = NO$$

HCN and CN also react to form NO by reactions important in the fuel nitrogen conversion mechanism.

Prompt NO is formed in all combustion systems but its contribution to the total NOx emission is combustion system and fuel dependent. In cement kilns, its contribution to the total NOx is negligible.

To control NOx emissions it is important to identify the dominant source during the combustion process. If thermal NOx is dominant, reduction in flame temperature is required or reduced residence time at high temperature in the flame gases. However, this may compromise process requirements. If fuel NOx is dominant, manipulation of the fuel air mixing, creating fuel rich zones (restricting oxygen availability during volatiles combustion) where fuel bound nitrogen can react to molecular nitrogen as opposed to NOx, offers significant potential. Work performed within the aforementioned Cemflam research programme at the IFRF[9] demonstrated a very important feature of rotary kiln flames. Dependent on burner type, primary air momentum and primary air percentage, a distinct ignition delay is generally observed before the flame is initiated. During this pre-ignition period, secondary air is being entrained into the primary air/fuel jet. The greater the ignition delay distance, the greater the amount of air entrained into the fuel jet prior to ignition. This results in higher flame temperatures resulting in increased thermal NOx formation and a more oxygen rich flame environment with consequential more effective conversion of fuel bound nitrogen to NOx. Experimental results confirming this effect is shown in Figure 11, where NOx levels are plotted against calculated amount of air entrained into the fuel jet at the point of ignition. FCTI are actively exploiting this phenomenon in the design of low NOx rotary kiln burners.

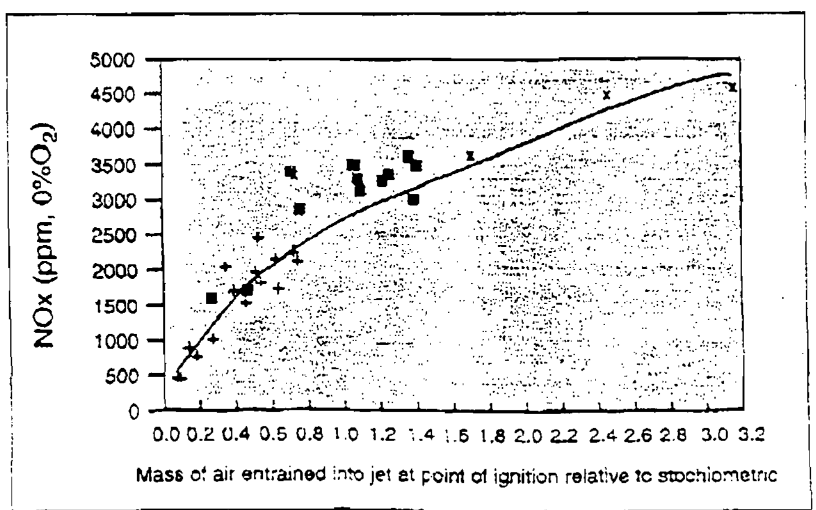

Figure 11. NOx emissions as a function of the amount of air entrained into the fuel jet at the point of ignition relative to stoichiometric (800 °C air preheat).

Future direction

With over two hundred examples of the aforementioned modelling techniques successfully applied to a wide range of real plants over the past 15 years, the authors have considerable confidence in the use of these techniques. Much of the future emphasis of FCTI's work will be directed towards NOx reduction whilst maintaining and improving predictability and product quality.

Conclusion

- The success of the modelling process is more dependent on the engineer's skill at interpreting the plant data and determining the relevant modelling techniques to use, than the elegance of the techniques themselves.
- Only engineers adequately trained in modelling generally, and computer modelling of combustion in particular, can be used to 'operate' these models.
- One technique used alone rarely offers sufficient information to provide a reliable solution. Engineers using modelling must therefore be skilled in the use of all the methods so that they do not favour the use of one technique above the others in possibly unsuitable circumstances.
- The users and designers of combustion equipment have tasks to perform of such magnitude that failure is not to be contemplated. No one should be willing to employ predictive means which have not been validated and in which they do not have complete faith.
- A thorough understanding of the various NOx formation mechanisms in combination with a detailed knowledge of the combustion process and the thermal and chemical interactions with the material being processed in a rotary kiln is necessary to design an effective low NOx combustion system.

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Enquiry no: 2

REPORT IN SUPPORT OF AN APPLICATION FOR A PSD CONSTRUCTION PERMIT REVIEW

PREPARED FOR:

SUWANNEE AMERICAN
CEMENT COMPANY
SUWANNEE COUNTY, FLORIDA

November 1998

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1.0 PROJECT DESCRIPTION

1.1 Synopsis of Application

APPLICANT: SUWANNEE AMERICAN CEMENT COMPANY
Post Office Box 410
Branford, Florida 32008

1.2 Facility Location

Suwannee American Cement Company plans to construct a new cement plant at their existing Branford Quarry. The quarry is located on U.S. 27 at C.R. 49, 3.7 miles east of Branford, Suwannee County, Florida. The UTM coordinates of the Suwannee American Cement Company facility are Zone 17, 321.4 km East and 3315.9 km North. See Figure 1 – Site Location Map.

1.3 Project Overview

The cement plant will be a dry process preheater/precalciner kiln. The plant will produce 2300 tons per day of clinker, and up to 1,191,360 tons per year of various types and grades of Portland cement. The produced cement will be stored in silos, and will be shipped in bulk by trucks; or will be bagged and palletized before shipping by trucks.

Suwannee American Cement Company is submitting this report in support of their application to the Florida Department of Environmental Protection for an Air Construction Permit.

1.4 Raw Material Processing: Quarry to Storage

Suwannee American Cement Company intends to construct a new Portland cement manufacturing facility at their Branford quarry. The plant site consists of approximately 80 acres located close to the center of more than 700 acres of limestone and overburden reserves. Limestone will be mined above and below the water table. The overburden, consisting of sand and clay, will be removed from the limestone surface and stockpiled in the vicinity of the crusher. The crusher will be moveable, and will be relocated periodically in accordance with the mining plan. The overburden and the limestone will be fed into the crusher with front-end loaders in the ratios dictated by the target chemical composition of the desired raw mix. These raw materials, called "quarry mix", will be delivered to the storage hall by a conveyor belt system.

The covered storage hall for the quarry mix will hold two (2) piles of 15,000 tons each. Stacking will be done with a traversing tripper conveyor from the apex of an A-frame cover. A scraper and rake device will reclaim the mix at the ground level of the stockpiles. The quarry mix will have a moisture content of 10-20%. The reclaimer will have a variable speed drive for a feed rate to the raw mill of 150-230 tons/hour.

The storage area has space for iron ore and/or coal ash, and the quarry mix. Each material will be fed by a front-end loader into its designated hopper and proportioned onto the reclaim belt with chain feeders and weigh belts.

No baghouses or other air pollution control devices are associated with these activities. Negligible emissions are expected from the handling of wet materials.

1.5 Raw Material Processing: Storage to Raw Mill

From the reclaim belt, the materials will be transported to a belt that feeds a raw mill feed bin. An apron feeder under the bin will control the feed rate to the roller mill rated at 212 short tons per hour (STPH).

The raw mill will be equipped with a high efficiency air separator and a reject recirculating bucket elevator. The product will be collected in cyclones, and conveyed with airslides to an airlift. Draft will be provided by a fan that discharges the gases and fine product to the in-line kiln/raw mill baghouse. Heat for raw material drying will be provided by the preheater exhaust gases. The baghouse catch (kiln dust) and the raw mill product will be conveyed to the blend silo.

1.6 In-Line Kiln/Raw Mill

The kiln feed from the blend silo will be conveyed to the preheater by means of an airlift. The feed will enter the top stage of the preheater or, during wet material conditions, drop into the next lower stage of the preheater to increase the gas temperature to the raw mill.

Coal and petroleum coke (petcoke) will be burned in the precalciner near the inlet to the kiln as well as at the main burner at the discharge end of the kiln. Natural gas will be used as a startup fuel and as a supplemental fuel. Whole tires and/or tire-derived fuel (TDF) will be used as a supplemental fuel. Combustion air for the precalciner will be provided through a tertiary air duct from the clinker cooler.

The kiln system will transform the raw meal into clinkers, which are gray, glass-hard, spherically shaped nodules that range from 0.125 to 2.0 inches in diameter. The rotary kiln will be sized to produce 2300 tons/day of clinker.

The emissions from burning coal, petcoke and tires will be equal or less than the emissions from burning only coal. Various references have shown that the emissions of criteria and noncriteria pollutants from cement kilns burning tires or tire-derived fuel (TDF) are not significantly different from emissions from kilns burning only their primary fuel.

Tires will be introduced in the vicinity of the feed shelf. Introduction of tires in this region, between the kiln feed end and the precalciner burner, will ensure that the precalciner burner will act as an afterburner. This will allow for more complete combustion of organic compounds.

"Types of fuels used vary across the industry. Historically, some combination of coal, oil, and natural gas was used, but over the last 15 years, most plants switched to coal, which generates less NOX than does oil or gas...The sulfur content of both raw materials and fuels varies from plant to plant and with geographic location. However, the alkaline nature

of the cement provides for direct absorption of SO2 into the product, thereby mitigating the quantity of SO2 emissions in the exhaust stream."
(Emission Factor Documentation for AP-42 Section 11.6: Portland Cement Manufacturing, USEPA 68-D2-0159, May 1994.)

1.7 Clinker Cooler

After discharge from the kiln, the clinker will be quenched in a reciprocating grate cooler with flow control grates. The exhaust gases from the cooler will be cleaned by a baghouse or an electrostatic precipitator (ESP). The cleaned gases will be exhausted through a stack. A portion of the clinker cooler gases will be ducted to the coal mill to dry the coal. These gases will then exhaust through the coal mill fabric filter. The discharge point of the clinker cooler will be vented by a fabric filter.

The clinker will be conveyed to clinker storage silos. The silos and conveying system will be vented by a fabric filter. The clinker will be withdrawn from the silos by vibrating feeders, and discharged onto the finish mill feed belt. The transfer points will be vented through baghouses. The mill feed conveyor will be an enclosed conveyor.

1.8 Clinker and Cement Processing

Gypsum and limestone will be received by truck and stored under cover in stockpiles. Each material will be transferred by a front-end loader to its designated feed hopper. These materials will be collected on a belt conveyor and transferred to the finish mill feed conveyor. The gypsum and limestone, grinding aids and other mineral aggregates will be interground with the clinker in the finish mill. The finish mill will produce 136 tons/hour of cement.

The finish mill will be in a closed circuit with a high efficiency air separator and cyclones. The mill will be vented by a fabric filter. A fabric filter will vent all the conveying equipment. The finished cement will be conveyed to the storage silos.

Finished cement will be stored in concrete silos, vented by baghouses. Cement withdrawal will occur through rotary shut-off valves, flow control valves, and airslides to vented retractable loading spouts. There will be a truck scale under each pair of silos. The silos will have additional outlets to convey cement to the bagging operation. Cement silo unloading rates will be 500 tons/hour. Each loading spout will be equipped with its own fabric filter.

The cement bagging operation will consist of a screen, a surge hopper, a bucket elevator, and an in-line packer. The bags will be palletized after being air cleaned. A fabric filter will vent all equipment, including the air cleaning device. The pallets will be moved by forklift to storage, from where they will be loaded on trucks.

1.9 Coal/Petcoke Processing

Coal and petcoke will be received by truck. The coal will drop into a hopper and be belt conveyed to a bucket elevator at a rate of 200 tons/hour. The bucket elevator will discharge the coal either into a covered storage facility or onto a belt and then to a bin. Coal in covered storage will be reclaimed by a front-end loader through the unloading system.

The coal will be metered from the bin to a vertical mill. The coal will be dried in the mill with hot air drawn from the clinker cooler. The milled coal will be collected in a product fabric filter, and stored in a milled coal bin. The milled coal bin will be vented through a fabric filter. The milled coal and petcoke will be pneumatically conveyed to the main burner and precalciner burner.

1.10 Cement Kiln Dust (CKD)

CKD is defined in the EPA's *Report to Congress on CKD* (December 1993), as follows:

> CKD is a fine-grained solid material generated as the primary by-product of the production of cement. CKD generation results directly from [the smokestack] control of particulate matter that would otherwise be discharged. In contrast to many other residues of industrial production, CKD is essentially an off-specification product: it much more closely resembles the raw material entering and product leaving the operation than many other industrial wastes.

This definition identifies CKD as the particulate matter captured by the main baghouse at the cement plant; and further describes the CKD as resembling the raw material and product streams. At many cement plants the CKD is a waste material which is not returned to the process for various process or product quality reasons, such as:

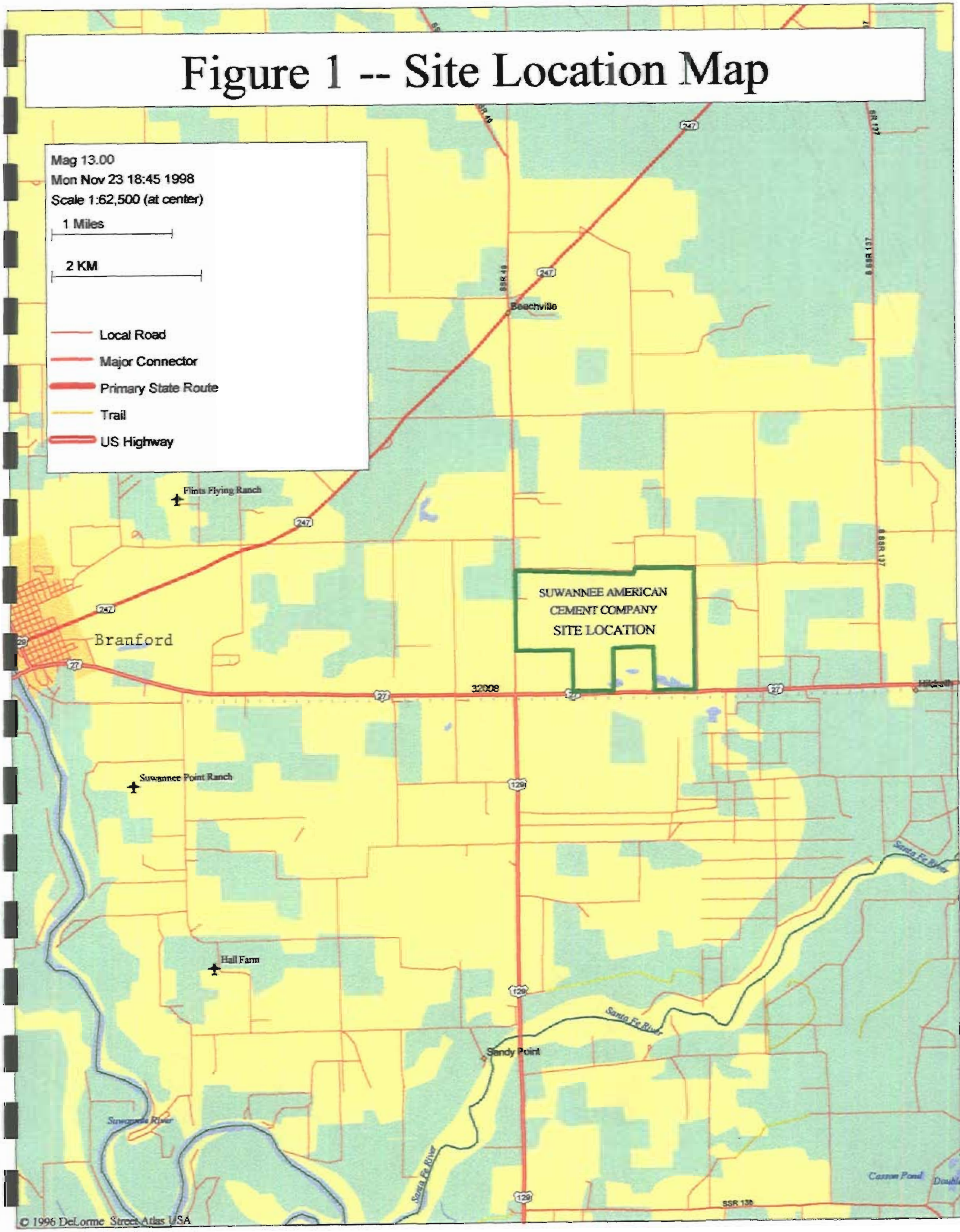
- Raw materials high in alkalis result in CKD high in alkalis, reintroduction to the process would result in off-specification product
- Raw materials high in chlorides result in CKD high in chlorides, reintroduction to the process tends to clog the ducts in the preheater
- Most wet-process kilns are unable to reintroduce the collected dust, as it is difficult to mix the hot dust with the cold slurry

The raw materials to be used at the cement plant are low in alkalis and chlorides. Reintroduction of the CKD into the process precludes the generation of CKD as a waste material.

The proposed cement plant will not generate cement kiln dust (CKD) as a waste product. All generated and captured dust will be returned to the production process to supplement the raw materials. There will be no disposal of captured dust. The process equipment utilized to transport the captured dust from the baghouse back into the process is enclosed and vented to baghouses. No unconfined emissions are expected from dust handling and transport activities. The dust handling system for the baghouse is described as follows:

Dust is gravity-fed to a pneumatic screw pump through a conveying pipe. This operation is enclosed and vented to a baghouse. The dust is then pumped either into the blend silo or into the kiln feed airlift. These activities are enclosed and vented to baghouses.

Figure 1 -- Site Location Map



2.0 GENERAL PRECONSTRUCTION REVIEW

2.1 Applicable Regulation

The Department of Environmental Protection has adopted Chapter 62-212 - Stationary Sources — Preconstruction Review to establish the preconstruction review requirements for proposed new emissions units or facilities, and proposed modifications.

The requirements apply to those proposed activities for which an air construction permit is required pursuant to Chapter 62-210, F.A.C. The chapter includes general preconstruction review requirements and specific requirements for emissions units subject to prevention of significant deterioration (PSD) and nonattainment-area preconstruction review. It also includes preconstruction review requirements applicable to specific emissions unit types and provisions for authorizing the creation of or change to any air emissions bubble.

2.2 Pollutants Subject to General Preconstruction Review

Pollutants subject to the general preconstruction review requirements are those pollutants not subject to preconstruction review under Rule 62-204.800(10)(d)2., 62-212.400, or 62-212.500, F.A.C.

The emissions of hazardous air pollutants (HAP), and those pollutants not subject to PSD review; from cement manufacturing were evaluated using AP-42, Fifth Edition, Table 11.6-9, *Summary of Noncriteria Pollutant Emission Factors for Portland Cement Kilns.*

A SCREEN model run was made to evaluate annual ambient impacts for those pollutants that have an annual Air Reference Concentration (ARC). Table 1 shows that all ambient concentrations are within guidelines.

TABLE 1 – HAP EVALUATION

POLLUTANT NAME	SYMBOL CAS #	HAP #	EMISSION FACTOR LB/TON CLINKER	EMISSION TPY	AMBIENT CONC. ug/m³	FARC ug/m³	EXCEED?
INORGANIC							
Arsenic	As	H015	1.2E-05	0.01	4.0E-05	2.3E-04	NO
Beryllium	Be	H021	6.6E-07	0.00	2.2E-06	4.2E-04	NO
Cadmium	Cd	H027	2.2E-06	0.00	7.3E-06	5.6E-04	NO
Chromium	Cr	H046	1.4E-04	0.06	4.7E-04	1.0E+03	NO
Fluoride	F	FL	9.0E-04	0.38	3.0E-03	5.0E+01	NO
Hydrogen Chloride	HCl	H106	1.4E-01	58.77	4.7E-01	7.0E+00	NO
Mercury	Hg	H114	2.4E-05	0.01	8.0E-05	3.0E-01	NO
Manganese	Mn	H113	8.6E-04	0.36	2.9E-03	5.0E-02	NO
Lead	Pb	PB	7.5E-05	0.03	2.5E-04	9.0E-02	NO
ORGANIC POLLUTANTS:							
Chloromethane	74-87-3	H118	3.8E-04	0.16	1.3E-03	2.8E-01	NO
Di-n-butylphthalate	84-74-2	H060	4.1E-05	0.02	1.4E-04	1.0E+02	NO
Ethylbenzene	101-41-4	H085	1.9E-05	0.01	6.3E-05	1.0E+03	NO
Formaldehyde	50-00-0	H095	4.6E-04	0.19	1.5E-03	7.7E-02	NO
Methyl Ethyl Ketone	78-93-3	H120	3.0E-05	0.01	1.0E-04	1.0E+03	NO
Methylene Chloride	75-09-2	H128	4.9E-04	0.21	1.6E-03	2.0E+00	NO
Bromomethane	74-83-9	H117	4.3E-05	0.02	1.4E-04	5.0E+00	NO
Carbon Disulfide	75-15-0	H032	1.1E-04	0.05	3.7E-04	2.0E+02	NO
Phenol	108-95-2	H144	1.1E-04	0.05	3.7E-04	3.0E+01	NO
Styrene	100-42-5	H163	1.5E-06	0.00	5.0E-06	1.0E+03	NO
Toluene	108-88-3	H169	1.9E-04	0.08	6.3E-04	4.0E+02	NO
Benzene	71-43-2	H017	1.6E-02	6.72	5.3E-02	1.2E-01	NO
Bis(2-ethhexyl)phthalate	117-81-7	H023	9.5E-05	0.04	3.2E-04	4.2E+00	NO
Xylenes	1330-20-7	H186	1.3E-04	0.05	4.3E-04	8.0E+01	NO

Emission factors from AP-42, 5th Edition.
Ambient concentrations determined from SCREEN model run.
FARC – *Florida Ambient Reference Concentrations*

2.3 Permitting Requirements

The Application and this report provide information on the nature and amounts of emissions from the proposed facility and on the location, design, construction, and operation of the proposed facility.

The information required by 40 CFR 63.43(e) is provided within the Application for Air Permit – Long Form. A NESHAP for this source category was proposed in the Federal Register on March 24, 1998 (63 FR 14182). This NESHAP is used as a presumptive MACT for this facility.

2.4 Other Applicable Regulations

The facility will be subject to the provisions of three New Source Performance Standards (NSPS). These NSPS are summarized as follows:

NSPS Subpart F: Standards of Performance for Portland Cement Plants (40CFR60.60)
Affected Facilities: Kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, finished product storage, conveyor transfer points, bagging and bulk loading and unloading system.
Affected Pollutant: Particulate Matter (PM)
Emission Standards:

Kiln emissions:	0.30 lb/ton of dry feed, 20% opacity
Clinker cooler:	0.10 lb/ton dry feed, 10% opacity
Other facilities:	10% opacity

NSPS Subpart Y: Standards of Performance for Coal Preparation Plants (40CFR60.250)
Affected Facilities: Thermal dryers, pneumatic coal-cleaning equipment (air tables), coal processing and conveying equipment (including breakers and crushers), coal storage systems, and coal transfer and loading systems.
Affected Pollutant: Particulate Matter
Emission Standards:
Thermal dryers: 0.031 gr/dscf, 20% opacity
Pneumatic coal cleaning equipment: 0.018 gr/dscf, 10% opacity
Other facilities: 20% opacity

NSPS Subpart OOO: Standards of Performance for Nonmetallic Mineral Processing Plants (40CFR60.670)

Affected Facilities: Crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck or railcar loading station.

Note: Affected facilities subject to subpart F are not covered by subpart OOO; also affected facilities that follow in the plant process any affected facilities under subpart F are not covered by subpart OOO. Therefore, subpart OOO applies to all nonmetallic mineral processing affected facilities upstream of raw material storage.

Affected Pollutant: Particulate Matter

Emission Standards:

Transfer Points: 0.022 gr/dscf, or 7% opacity,

Fugitive emissions <10% opacity

Other facilities: 0.022 gr/dscf, or 7% opacity

Fugitive emissions <10% opacity

Crusher w/o APC: Fugitive <15% opacity

The facility will also be subject to the provisions of FAC rule 62-296.407 that limits particulate matter emissions from Portland cement plants. This rule limits PM emissions from kilns to 0.3 pounds per ton of feed to the kiln, and PM emissions from clinker coolers to 0.1 pounds per ton of feed to the kiln.

3.0 PREVENTION OF SIGNIFICANT DETERIORATION

3.1 General Requirements

The provisions of Rule 62-212.400 generally apply to the construction or modification of air pollutant emitting facilities in those parts of the state in which the state ambient air quality standards are being met. The rule also establishes various requirements for existing emissions units and facilities in such areas, including specific construction/operation permit requirements.

3.2 Applicability

This rule establishes the criteria for determining whether or not a proposed new facility or modification to a facility is subject to the preconstruction review requirements. A proposed new major facility shall be subject to preconstruction review if:

- This proposed new major facility is not exempted under Rule 62-212.400(2)(a) or (b), F.A.C.

- For any pollutant regulated under the Act, except for lead, the sum of the quantifiable fugitive emissions and the potential emissions of all emissions units at the facility which have the same "Major Group" Standard Industrial Classification (SIC) Code would be equal to or greater than 250 tons per year; or

- For any pollutant regulated under the Act, except for lead, the sum of the quantifiable fugitive emissions and the potential emissions of all emissions units at the facility which have the same "Major Group" Standard Industrial Classification (SIC) Code would be equal to or greater than 100 tons per year; and the facility would belong to any of the facility categories listed in Table 212.400-1, Major Facility Categories; or

- For lead or lead compounds, measured as elemental lead, the sum of the quantifiable fugitive emissions and the potential emissions of all emissions units at the facility which have the same "Major Group" Standard Industrial Classification (SIC) Code would be equal to or greater than 5 tons per year.

Lead emissions from the proposed facility are estimated at 63 pounds per year (0.03 tons/year).

The proposed facility belongs to one of the facility categories listed in Table 2, Major Facility Categories (Portland cement plants) and has quantifiable fugitive emissions and potential emissions of the following regulated pollutants equal to or greater than 100 tons per year:

• Particulate Matter (total)	PM =	267 tons/year
• Particulate Matter (<10 microns)	PM10 =	228 tons/year
• Sulfur Dioxide	SO2 =	118 tons/year
• Nitrogen Oxides	NOX =	1175 tons/year
• Carbon Monoxide	CO =	1511 tons/year

This cement plant is considered a major new facility subject to both state and federal regulations as set forth in Chapter 62-212, FAC. The facility is located in an area classified as attainment for each of the regulated air pollutants. The operation of the proposed plant will result in significant levels (as defined by Rule 62-212.400, FAC) of emissions of particulate matter (PM), particulate matter smaller than 10 microns in diameter (PM10), nitrogen oxides (NOX), sulfur dioxide (SO2), carbon monoxide (CO), and volatile organic compounds (VOC), as defined by Rule 62-212.400 FAC, and will therefore be subject to PSD review requirements in accordance with FAC Rule 62-212.400, FAC. This will include a determination of Best Available Control Technology, an air quality review, Good Engineering Practice stack height analysis and an evaluation of impacts to soils, vegetation and visibility.

TABLE 2 -- MAJOR FACILITY CATEGORIES (LIST OF 28)

- Fossil fuel fired steam electric plants of more than 250 million Btu/hr heat input
- Coal cleaning plants (with thermal dryers)
- Kraft pulp mills
- **PORTLAND CEMENT PLANTS**
- Primary zinc smelters
- Iron and steel mill plants
- Primary aluminum ore reduction plants
- Primary copper smelters
- Municipal incinerators capable of charging more than 250 tons of refuse per day
- Hydrofluoric acid plants
- Sulfuric acid plants
- Nitric acid plants
- Petroleum refineries
- Lime plants
- Phosphate rock processing plants
- Coke oven batteries
- Sulfur recovery plants
- Carbon black plants (furnace process)
- Primary lead smelters
- Fuel conversion plants
- Sintering plants
- Secondary metal production plants
- Chemical process plants
- Fossil fuel boilers (or combinations thereof) totaling more than 250 million Btu/hr heat input
- Petroleum storage and transfer units with total storage capacity exceeding 300,000 barrels
- Taconite ore processing plants
- Glass fiber processing plants
- Charcoal production plants

Reference: Table 62-212.400-1, F.A.C.

3.3 Pollutants Subject to PSD Preconstruction Review

The preconstruction review requirements apply to all pollutants regulated under the Act for which the sum of the potential emissions and the quantifiable fugitive emissions of the facility or modification would be equal to or greater than the significant emission rates listed in Table 212.400-2, Regulated Air Pollutants - Significant Emission Rates; or for which the sum of the potential emissions and the quantifiable fugitive emissions of the facility or modification would be greater than zero when the facility is located within 10 kilometers of a Class I area and the potential and quantifiable fugitive emissions would have an impact on the Class I area equal to or greater than 1.0 microgram per cubic meter (24-hour average).

See Table 3 for all pollutants regulated under the Act for which the sum of the potential emissions and the quantifiable fugitive emissions of the facility would be equal to or greater than the significant emission rates listed in Table 212.400-2, Regulated Air Pollutants - Significant Emission Rates.

The proposed facility is farther than 10 kilometers from the nearest Class I Area.

TABLE 3 --
REGULATED AIR POLLUTANTS SIGNIFICANT EMISSION RATES

Pollutant	Significant Emission Rate (Tons/Year)	Facility Emission Rate (Tons/Year)	PSD ?
Carbon monoxide	100	1511	YES
Nitrogen oxides	40	1175	YES
Sulfur dioxide	40	118	YES
Ozone	40 VOC	50 VOC	YES
Particulate matter	25	267	YES
PM10	15	228	YES
Sulfuric acid mist	7	6	NO
Fluorides	3	3.8×10^{-1}	NO
Lead	6.0×10^{-1}	3.0×10^{-2}	NO
Mercury	1.0×10^{-1}	1.0×10^{-2}	NO
Beryllium	4.0×10^{-4}	2.8×10^{-4}	NO
Asbestos	7.0×10^{-3}	Not Applicable	
Hydrogen sulfide (H_2S)	10	Not Applicable	
Total reduced sulfur (including H_2S)	10	Not Applicable	
Reduced sulfur compounds (including H_2S)	10	Not Applicable	
Vinyl chloride	1	Not Applicable	
Municipal waste combustor organics	3.5×10^{-6}	Not Applicable	
Municipal waste combustor metals	15	Not Applicable	
Municipal waste combustor acid gases	40	Not Applicable	
Municipal solid waste landfill emissions	50	Not Applicable	

References: Table 62-212.400-2, F.A.C. and 40 CFR 51.166(b)(23)

3.4 Limited Exemptions and Special Provisions

The preconstruction review requirements establish exemptions and exclusions from certain of the General Provisions of Rule 62-212.400(4), F.A.C., and PSD Review Requirements of Rule 62-212.400(5), F.A.C.

3.4.1 *Temporary Emissions*

A proposed facility subject to preconstruction review is exempt from certain requirements of Rule 62-212.400, for a particular pollutant, provided:

- The duration of emissions of the facility would not exceed two years;
- The owner or operator of the facility has provided the Department with reasonable assurance that the emissions of the facility would not cause or contribute to a violation of any ambient air quality standard or have a significant impact on any Class I area or area where an applicable maximum allowable increase is known to be violated.

The applicant requests an emission limitation for NOX that would exceed BACT for a two-year "shakedown" period for the plant. This is consistent with a similar recent PSD permit issued by the Department. This will allow the operator to fine-tune the combustion characteristics of the plant.

The ambient impact analyses conducted for this report used the higher requested emission rate to provide the Department with reasonable assurance that the emissions of NOX would not cause or contribute to a violation of any ambient air quality standard or have a significant impact on any Class I area or area where an applicable maximum allowable increase is known to be violated.

3.4.2 *Construction Related Emissions*

Concentrations of particulate matter attributable to the increase in emissions from construction or other temporary emission-related activities of new or modified facilities shall be excluded in determining compliance with any maximum allowable increase.

3.4.3 *General Ambient Monitoring Exemption*

A proposed facility or modification subject to preconstruction review is exempt from preconstruction and postconstruction ambient monitoring with respect to a specific pollutant if:

- The emissions of the pollutant from the new facility or the net emissions increase of the pollutant from the modification would not have an impact on any area equal to or greater than that listed in Table 212.400-3, De Minimus Ambient Impacts; or
- The ambient concentration of the pollutant in the area that the proposed facility or modification would affect is less than the appropriate de minimus concentration listed in Table 212.400-3; or

- The pollutant is not listed in Table 212.400-3.

See Table 4 – De Minimus Ambient Impacts. Of the nine pollutants in Table 212.400-3, four are subject to PSD review for the proposed facility – NOX, SO2, PM10, and CO. Of these, NOX, SO2, and CO result in ambient concentrations well below the de minimus levels.

The ambient concentrations resulting from the emissions of PM10 exceed the de minimus levels. The Department operates three nearby PM10 monitors – two in Alachua County and one in Hamilton County.

The Department has waived the requirement for ambient monitoring on similar recent PSD facilities.

TABLE 4 -- DE MINIMUS AMBIENT IMPACTS

Pollutant	Concentration ($\mu g/m^3$)	Averaging Period	PSD ?	Modeled Concentration ($\mu g/m^3$)
Nitrogen dioxide	14	Annual	YES	3.0
Sulfur dioxide	13	24-hour	YES	3.8
PM10	10	24-hour	YES	26.7
Carbon monoxide	575	8-hour	YES	106.7
Ozone	See Note		YES	Not Applicable <100 TPY VOC
Lead	0.1	Quarterly	NO	Not Applicable
Fluorides	0.25	24-hour	NO	Not Applicable
Mercury	0.25	24-hour	NO	Not Applicable
Hydrogen sulfide	0.2	1-hour	NO	Not Applicable

Reference: Table 62-212.400-3, F.A.C.
Modeled ambient air concentrations for referenced averaging periods by ISCST3 Version 98226.

NOTE: No de minimus air quality level is provided for ozone. However, any net increase of 100 tons per year or more of volatile organic compounds subject to preconstruction review would be required to perform an ambient impact analysis, including the gathering of ambient air quality data.

3.5 Class I Area Review

The proposed facility is located within 100 kilometers of the Okefenokee National Wilderness Area. However, the ambient concentrations at the Class I area resulting from emissions from the proposed facility are less than significant.

No variances from Class I increments are necessary, as the ambient concentrations at the Class I area resulting from emissions from the proposed facility are less than significant. See Table 5 – Class I Area Increments.

TABLE 5 -- CLASS I AREA INCREMENTS

Pollutant	Averaging Period	Increment (μg/m³)	Significance Level (μg/m³)	Modeled Concentration (μg/m³)	Significant?
PM10	Annual	4	0.2	0.005	NO
	24-hour	8	0.3	0.2	NO
Sulfur dioxide	Annual	2	0.1	0.002	NO
	24-hour	5	0.2	0.07	NO
	3-hour	25	1.0	0.3	NO
Nitrogen dioxide	Annual	2.5	0.1	0.03	NO

References: Rule 62-204.260, F.A.C.
***Chassahowitzka Class I Area Study Description*, FDEP, May 1996 draft**

3.6 Baseline Related Provisions

The proposed facility is shown to not exceed any applicable PSD increments, by showing that such increments are not exceeded when the facility's emissions are modeled with the 20-D inventory of sources within 66 kilometers.

This approach is considered to be more conservative, more accurate and less cumbersome than determining baseline emissions.

3.7 Preconstruction Review General Requirements

The proposed facility is subject to preconstruction review. This report accompanies an Application for Air Permit – Long Form. Construction of the proposed facility will not commence until an air construction permit is obtained from the Department.

BACT will be applied for the following pollutants subject to preconstruction review:

- Carbon monoxide
- Nitrogen oxides
- Sulfur dioxide
- Ozone (as VOC)
- Particulate matter
- PM10

3.8 Ambient Impact Analysis

The air quality review required of a PSD construction permit application potentially requires both air quality modeling and air quality monitoring. The air quality monitoring is required when the impact of air pollutant emission increases and decreases associated with a proposed project exceed the de minimus impact levels defined by Rule 62-212, FAC or in cases where an applicant wishes to define existing ambient air quality by monitoring rather than by air quality modeling. The air quality modeling is required to provide assurance that the emissions from the proposed project, together with the emissions of all other air pollutants in the project area, will not cause or contribute to a violation of any ambient air quality standard.

The EPA and the State of Florida have developed/adopted ambient air quality standards. Primary AAQS protect the public health while the secondary AAQS protect the public welfare from adverse effects of air pollution. Areas of the country have been designated as attainment or nonattainment for specific pollutants. Areas not meeting the AAQS for a given pollutant are designated as nonattainment areas for that pollutant. Any new source or expansion of existing sources in or near these nonattainment areas are usually subject to more stringent air permitting requirements. Projects proposed in attainment areas are subject to air permit requirements that would ensure continued attainment status.

In promulgating the 1977 CAA Amendments, Congress quantified concentration increases above an air quality baseline concentration level for sulfur dioxide and particulate matter which would constitute significant deterioration. The size of the allowable increment depends on the classification of the area in which the source would be located or have an impact. Class I areas include specific national parks, wilderness areas and memorial parks. Class II areas are all areas not designated as Class I areas and Class III areas are industrial areas in which greater deterioration than Class II areas would be allowed. There are no designated Class III areas in Florida.

In 1988, EPA promulgated PSD regulations for nitrogen oxides and PSD increments for nitrogen dioxide concentrations. FDEP adopted the nitrogen dioxide increments in July 1990.

An application for a PSD permit requires an analysis of ambient air quality in the area affected by the proposed facility or major modification. For a new major facility, the affected pollutants are those that the facility would potentially emit in significant amounts.

A source impact analysis is required for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate. Specific atmospheric dispersion models are required in performing the impact analysis. The analysis demonstrates the project's compliance with AAQS and allowable PSD increments.

Typically, a five-year period is used for the evaluation of the highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors. The second-highest concentration is considered because short-term AAQS specify that the standard should not be exceeded at any location more than once a year.

Air quality modeling was performed for the following pollutants subject to PSD review to demonstrate compliance with applicable ambient air quality standards and PSD increments:

- Carbon monoxide
- Nitrogen oxides
- Sulfur dioxide
- PM10

This modeling demonstrated compliance with all applicable standards, including Ambient Air Quality Standards (AAQS), PSD Class II increments, and PSD Class I increments.

The source-alone emissions were modeled using the **ISC-ST3 version 98226** model to determine the Area of Significant Impact (ASI) for the various averaging periods. The modeling utilized upper-air meteorological data from the Waycross, Georgia station, and surface meteorological data from the Gainesville, Florida station. See Table 6 – Class II Area Significance.

Sulfur dioxide and carbon monoxide were determined to have less than significant impacts in the Class II area. No further dispersion modeling was performed for these pollutants. This demonstrates compliance with ambient air quality standards and PSD increments for these pollutants.

Likewise, the ambient air concentrations of all pollutants and averaging periods were below the Class I significance levels at the Okefenokee National Wildlife Area. See Table 5 – Class I Area Increments.

The ambient air concentrations for nitrogen oxides and PM10 for all periods fell below the Class II significance levels within a 7-kilometer radius of the facility. Refined dispersion modeling was conducted for these pollutants within this radius.

An inventory was obtained from the Department's Bureau of Information Systems of all permitted air emission sources within the following counties:

- Alachua
- Baker
- Bradford
- Columbia
- Dixie
- Gilchrist
- Hamilton

- Lafayette
- Levy
- Madison
- Suwannee
- Taylor
- Union

These counties comprise an approximately 75-kilometer radius from the source. This inventory was combined with a Title V source inventory, also from the Department, and an inventory used for a similar recent project. A 20-D analysis was conducted on this base inventory. The 20-D analysis calculates two things: The total emissions of a given pollutant from a given facility are calculated in tons per year (tpy); and the distance between the proposed cement plant and the existing facility is calculated in kilometers (D). The distance is multiplied by 20, and this value is compared to the facility's emissions in tons per year. Any facility where the 20-D value is greater than the emission value is assumed to have a negligible effect on the ambient air concentrations of the given pollutant at the proposed cement plant.

The resulting inventories for NOX and PM10 were modeled with the facility's emissions to determine compliance with the AAQS. See Table 9 – NOX 20-D Inventory and Table 10 – PM10 20-D Inventory.

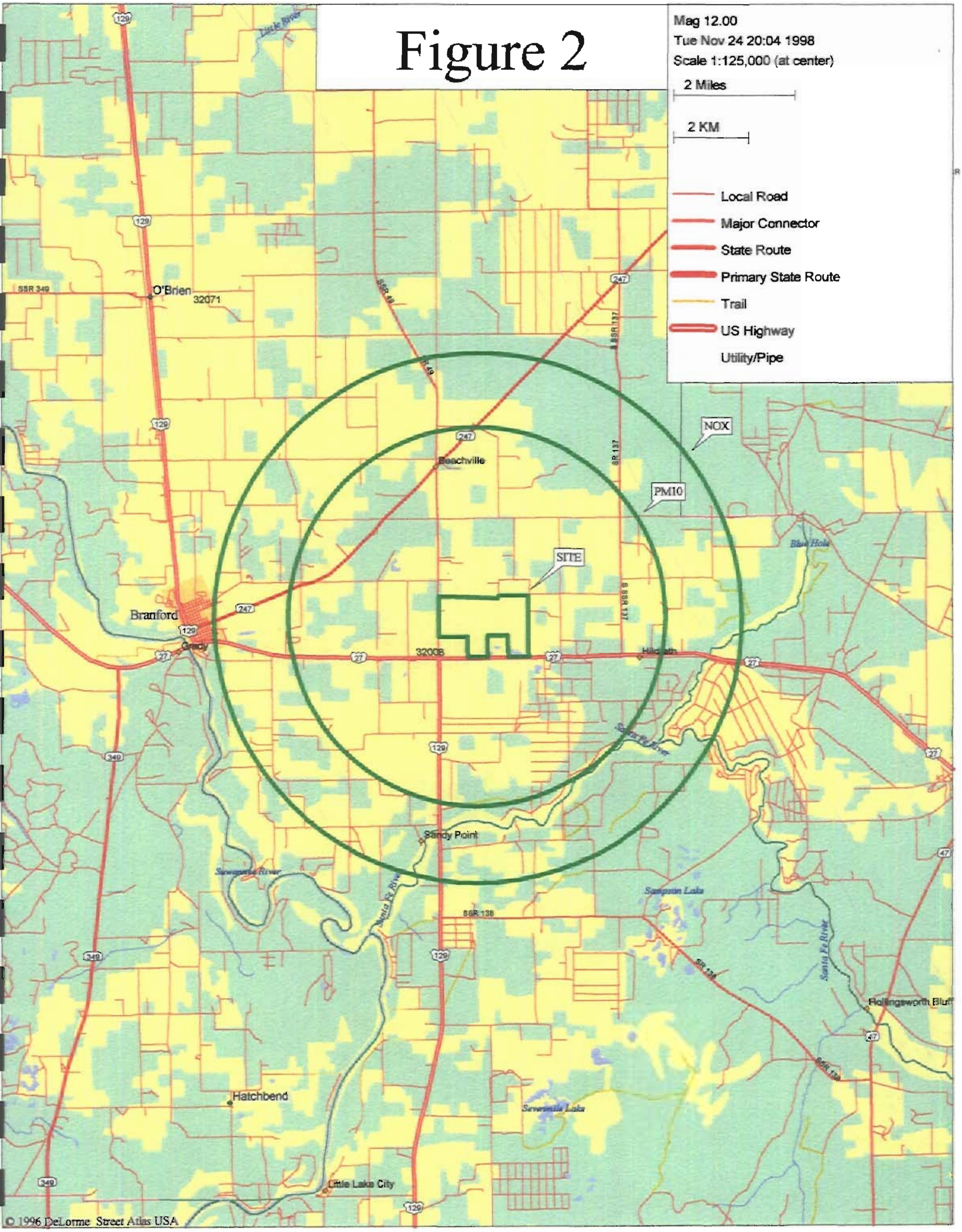
Additionally, background concentrations of PM10 and NOX were estimated from the Department's ALLSUM reports. These background concentrations account for unpermitted sources, mobile sources, and other background concentrations. The background concentrations are added to the modeled concentrations to evaluate compliance with the AAQS. See Table 11 -- PM10 Monitoring Data for Background Concentrations and Table 12 -- NOX Monitoring Data for Background Concentrations

The ambient air concentrations from the proposed cement plant, plus the 20-D inventories, plus the background concentrations, were evaluated with respect to the applicable AAQS.

This refined air quality modeling demonstrated that the AAQS were not violated for PM10 or NOX. See Table 7 – Ambient Air Quality Standards.

The ambient air impacts of the proposed cement plant were evaluated with respect to the allowable PSD Class II increments. Generally, a different inventory is created which includes those facilities that have consumed or expanded the available PSD Class II increments. However, in this case, the ambient air concentrations resulting from the proposed cement plant plus the 20-D inventory were below the allowable increments. The use of the 20-D inventory results in a conservative evaluation of compliance with the PSD Class II increments, as all permitted allowable emissions are assumed as increment-consuming.

Figure 2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State Route
Primary State Route
Trail
US Highway
Utility/Pipe
NOX
PM10
SITE
O'Brien
32071
Branford
Beechville
32008
Sandy Point
Hatchbend
Little Lake City
Hollingsworth Bluff
SSR 138
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TABLE 6 -- CLASS II AREA SIGNIFICANCE

Pollutant	Averaging Period	Increment (μg/m³)	Significance Level (μg/m³)	Modeled Concentration (μg/m³)	Significant?
PM10	Annual	17	1	**3.2**	**YES**
	24-hour	30	5	**26.7**	**YES**
Sulfur dioxide	Annual	20	1	**0.2**	**NO**
	24-hour	91	5	**3.8**	**NO**
	3-hour	512	25	**14.0**	**NO**
Nitrogen dioxide	Annual	25	1	**3.0**	**YES**
Carbon Monoxide	1-hour	---	2000	**303.1**	**NO**
	8-hour	---	500	**106.7**	**NO**
Lead	Quarterly	---	0.03	**0.001**	**NO**

References: Rule 62-204.200(29), F.A.C. and Rule 62-204.260, F.A.C.
Modeled ambient air concentrations for referenced averaging periods by ISCST3 Version 98226.

TABLE 7 -- AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	State Ambient Standard (µg/m^3)	Federal Primary Ambient Standard (µg/m^3)	Federal Secondary Ambient Standard (µg/m^3)	Modeled Concentration Facility + Inventory + Background (µg/m^3)
Sulfur Dioxide	3-hour	1300	---	1300	**Facility Not Significant**
	24-hour	260	365	---	
	Annual	60	80	---	
PM10	24-hour	150			**81.0**
	Annual	50			**24.5**
PM2.5	24-hour	---	65		**Not Yet Implemented**
	Annual	---	15		
Carbon Monoxide	1-hour	40,000		---	**Facility Not Significant**
	8-hour	10,000		---	
Ozone	1-hour	---	235		**Not Applicable <100 TPY VOC**
	8-hour	---	157		
	Daily	235	---	---	
Nitrogen Dioxide	Annual	---	100		**11.5**
Lead	Quarterly	---	1.5		**Facility Not Significant**

References: Rule 62-204.240, F.A.C. and 40 CFR 50
Modeled ambient air concentrations for referenced averaging periods by ISCST3 Version 98226.

TABLE 8 -- CLASS II AREA INCREMENTS

Pollutant	Averaging Period	Increment ($\mu g/m^3$)	Modeled Concentration Facility + Inventory ($\mu g/m^3$)
PM10	Annual	17	**3.5**
	24-hour	30	**27.0**
Nitrogen dioxide	Annual	25	**3.5**

Reference: Rule 62-204.260, F.A.C.
Modeled ambient air concentrations for referenced averaging periods by ISCST3 Version 98226.

TABLE 9 – NOX 20-D INVENTORY

Facility ID	Owner/Company	NOX TPY	North (km)	East (km)	distance	20 x D	Model?
7770237	**ANDERSON MINING CORPORATION**	**24.6**	3324.5	333.2	15	**292**	**NO**
	ASPHALT PAVERS INC #2 Plant	**28.47**	3322	345.24	25	**492**	**NO**
	FOREST LAWN MEMORIAL GARDENS	**0.55**	3332.65	342.91	27	**545**	**NO**
0230019	**VETERANS AFFAIRS MEDICAL CENTER** Lake City	**0.49**	3340.04	340.65	31	**618**	**NO**
0230034	**ANDERSON COLUMBIA, INC** #8 PLANT	**6.5**	3343.3	341.05	34	**674**	**NO**
7775042	**ANDERSON COLUMBIA, INC.1**	**12.44**	3343.13	342.37	34	**687**	**NO**
7770270	**ANDERSON COLUMBIA, INC. #1**	**7.2**	3343.28	342.63	35	**693**	**NO**
0010087	**FLORIDA ROCK INDUSTRIES INC.** Newberry Cement Plant	**1018**	3287.04	348.35	39	**790**	**YES**
1210008	**GOLD KIST INC. FEED MILL**	**12.83**	3354	307.5	41	**811**	**NO**
0010040	**EVEREADY BATTERY COMPANY, INC.**	**20.19**	3294.78	361.49	45	**906**	**NO**
	SUWANNEE LUMBER COMPANY	**4.47**	3279.74	292.43	46	**927**	**NO**
0010006	**GAINESVILLE REGIONAL UTILITIES** Deerhaven Station	**10511.3**	3292.6	365.7	50	**1001**	**YES**
0070012	**FLORIDA GAS TRANSMISSION CO.** Bradford County Station #16	**77.2**	3310.6	371.9	51	**1016**	**NO**
	ENRON_GAS PROCESSING CO	**2817.44**	3311.3	372.3	51	**1022**	**YES**
0470002	**WHITE SPRINGS AGRICULTURAL CHEMICALS,INC** Suwannee River Complex	**795.73**	3368.78	330	54	**1071**	**NO**
0470005	**WHITE SPRINGS AGRICULTURAL CHEMICALS,INC** Swift Creek Complex	**402.2**	3369.8	320.9	54	**1078**	**NO**
1210018	**GOLD KIST INC. POULTRY PLANT** Live Oak	**19.35**	3361.4	292.2	54	**1081**	**NO**
1210003	**FLORIDA POWER CORPORATION** Suwannee River Plant	**472.98**	3362.2	290.5	56	**1113**	**NO**
7770088	**WHITE CONSTRUCTION**	**17.3**	3373.3	314.8	58	**1156**	**NO**
	UNIV._OF FLORIDA-ANIMAL	**3.08**	3279.62	367.03	58	**1166**	**NO**
0010002	**BEAR ARCHERY INC.**	**2.37**	3276.5	365.71	59	**1186**	**NO**
0010057	**FOREST MEADOWS FUNERAL HOME, INC.**	**1.314**	3283.8	371.4	59	**1188**	**NO**
0010001	**FLORIDA POWER CORPORATION** UF Cogeneration Plant	**167.3**	3279.3	369.4	60	**1207**	**NO**
	UNIV._OF FLORIDA - ANMLE	**0.61**	3279.37	369.93	61	**1215**	**NO**
0010070	**WILLIAMS COLONIAL CREMATORY**	**0.657**	3281.23	371.65	61	**1221**	**NO**
0010056	**CENTRAL FL CREMATORIUM** AKA MILAM FUNERAL	**1.314**	3280.3	371.8	62	**1234**	**NO**
0010005	**GAINESVILLE REGIONAL UTILITIES** John R. Kelly Plant	**2369.24**	3280.1	372.1	62	**1241**	**YES**
1230001	**BUCKEYE FLORIDA, LIMITED PARTNERSHIP**	**1362.88**	3328.7	256.7	66	**1319**	**YES**

TABLE 10 – PM10 20-D INVENTORY
(Page 1 of 3)

Facility ID	Owner/Company	PM10 TPY	North (km)	East (km)	distance	20 x D	Model?
1210011	ANDERSON COLUMBIA, INC. #4	37.5	3315	322	1	24	YES
7770237	ANDERSON MINING CORPORATION	1.8	3325	333	15	292	NO
	ASPHALT PAVERS INC #2 P	45.2	3322	345	25	492	NO
0230032	FOREST LAWN MEMORIAL GARDENS	0.8	3333	343	27	545	NO
7770079	WHITE CONSTRUCTION COMPANY, INC.	40.6	3300	347	30	605	NO
0010061	FLORIDA ROCK INDUSTRIES INC HIGH SPRINGS	16.1	3299	347	31	614	NO
0230019	VETERANS AFFAIRS MEDICAL CENTER Lake City	2.8	3340	341	31	618	NO
	ANDERSON COLUMBIA THERM	32.4	3341	341	31	627	NO
	NORTH_FLORIDA CONCRETE,Y	31.7	3340	342	32	637	NO
	NORTHEAST FLORIDA STATE	14.5	3340	342	32	637	NO
0670001	MAYO READY-MIX CONCRETE, INC FKA North Fla. Concrete	6.4	3326	291	32	643	NO
0230008	PURINA MILLS, INC.	150.4	3341	341	32	646	NO
7770029	KLEENSOIL INTERNATIONAL INC. Mobile Remediation Unit #1	32.4	3341	342	32	647	NO
0230026	COLUMBIA READY MIX CONCRETE, INC.	142.0	3343	342	34	674	NO
	ANDERSON COLUMBIA, INC.	169.0	3343	341	34	677	NO
7775042	ANDERSON COLUMBIA, INC.1	5.0	3343	342	34	687	NO
1210015	HOWLAND FEED MILL, INC.	16.2	3351	313	37	731	NO
0410002	FL DEPT OF CORRECTIONS – LANCASTER CORR.	0.9	3278	329	39	780	NO
0010087	FLORIDA ROCK INDUSTRIES INC. Newberry Cement Plant	141.3	3287	348	39	790	NO
0010072	UNIV. OF FLORIDA BIOTECHNOLOGY DEV.INST.	5.5	3296	355	40	791	NO
0010073	DRILTECH INC.	1.3	3295	356	40	801	NO
7774808	JOHN C. HIPP CONSTRUCTION CO. ALACHUA	28.7	3297	357	40	806	NO
0290003	GEORGIA-PACIFIC CORP. CHIP/SAW	86.8	3279	300	43	854	NO
0010064	SOUTHERN PRE-CAST, INC.	15.1	3296	359	43	855	NO
0010053	J-M MANUFACTURING CO, INC.	38.4	3280	345	43	857	NO
0750028	ANDERSON MATERIALS COMPANY INC	5.0	3272	315	44	882	NO
0290008	CROSS CITY VENEER COMPANY, INC.	5.3	3280	295	45	895	NO
0010040	EVEREADY BATTERY COMPANY, INC.	45.1	3295	361	45	906	NO

TABLE 10 – PM10 20-D INVENTORY
(Page 2 of 3)

0290004	**SUWANNEE LUMBER COMPANY**	**57.8**	3280	292	46	**927**	**NO**
1250006	**FL DEPT OF CORRECTIONS** North Fla. Reception Center	**2.1**	3318	369	48	**950**	**NO**
	MOBILE RECLAIM, INC.	**22.5**	3282	355	48	**959**	**NO**
0010006	**GAINESVILLE REGIONAL UTILITIES** Deerhaven Station	**1823.2**	3293	366	50	**1001**	**YES**
0070012	**FLORIDA GAS TRANSMISSION CO.** Bradford County Station #16	**1.2**	3311	372	51	**1016**	**NO**
	ENRON_GAS PROCESSING CO	**3.4**	3311	372	51	**1022**	**NO**
1250005	**GILMAN PAPER COMPANY**	**69.2**	3320	374	52	**1045**	**NO**
0030006	**FL DEPT OF CORRECTIONS** Baker Correctional	**2.0**	3343	368	53	**1068**	**NO**
0470002	**WHITE SPRINGS AGRICULTURAL CHEMICALS,INC** Suwannee River Complex	**2740.1**	3369	330	54	**1071**	**YES**
0470005	**WHITE SPRINGS AGRICULTURAL CHEMICALS,INC** Swift Creek Complex	**7.9**	3370	321	54	**1078**	**NO**
1210018	**GOLD KIST INC. POULTRY PLANT - LIVE OAK**	**1.9**	3361	292	54	**1081**	**NO**
0010037	**V. E. WHITEHURST & SONS, INC.**	**130.6**	3289	369	54	**1088**	**NO**
1210003	**FLORIDA POWER CORPORATION** Suwannee River Plant	**3460.2**	3362	291	56	**1113**	**YES**
	ANDERSON COLUMBIA, INC.	**45.2**	3345	370	57	**1143**	**NO**
0010007	**MADDOX FOUNDRY & MACHINE WORKS,INC.**	**29.5**	3267	352	58	**1153**	**NO**
7770088	**WHITE CONSTRUCTION**	**12.8**	3373	315	58	**1156**	**NO**
0010080	**UNIV. OF FLORIDA-ANIMAL RESEARCH (FARM)**	**0.3**	3280	367	58	**1166**	**NO**
0010002	**BEAR ARCHERY INC.**	**59.9**	3277	366	59	**1186**	**NO**
0010057	**FOREST MEADOWS FUNERAL HOME, INC.**	**3.5**	3284	371	59	**1188**	**NO**
0010003	**KOPPERS INDUSTRIES, INC.**	**25.0**	3283	372	60	**1199**	**NO**
0010001	**FLORIDA POWER CORPORATION** UF Cogeneration	**108.8**	3279	369	60	**1207**	**NO**
	V.A. MEDICAL CENTER	**10.7**	3279	370	61	**1214**	**NO**
0010062	**UNIV. OF FLORIDA - ANML RESRCE/HUMAN CRE**	**5.3**	3279	370	61	**1215**	**NO**
0010063	**UNIV. OF FLORIDA – VETERINARY INCINRATOR**	**1.5**	3279	370	61	**1220**	**NO**
0010070	**WILLIAMS COLONIAL CREMATORY**	**1.2**	3281	372	61	**1221**	**NO**
0010056	**CENTRAL FL CREMATORIUM AKA MILAM FUNERAL**	**0.9**	3280	372	62	**1234**	**NO**
0010005	**GAINESVILLE REGIONAL UTILITIES** John R. Kelly Power Plant	**489.4**	3280	372	62	**1241**	**NO**
0010054	**RINKER MATERIALS CORPORATION GVL**	**21.9**	3280	372	62	**1242**	**NO**
0010066	**UNIV. OF FLORIDA – TACACHALE**	**0.2**	3283	374	62	**1249**	**NO**

TABLE 10 – PM10 20-D INVENTORY
(Page 3 of 3)

1250004	FL DEPT OF CORRECTIONS – UNION CORR INST	11.2	3327	386	65	1300	NO
0070009	FL DEPT OF CORRECTIONS – FL STATE PRISON	1.3	3326	386	65	1305	NO
0290011	FLORIDA ROCK INDUSTRIES, INC. DIXIE	13.1	3265	280	66	1310	NO
1230001	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	2998.4	3329	257	66	1319	YES

References: **Inventory provided by FDEP, 11/6/98, all facilities in Alachua, Baker, Bradford, Columbia, Dixie, Gilchrist, Hamilton, Lafayette, Levy, Madison, Suwannee, Taylor and Union counties**

TABLE 11 --PM10 MONITORING DATA FOR BACKGROUND CONCENTRATIONS

YEAR	COUNTY	MONITOR LOCATION	Concentrations ($\mu g/m^3$) 1st	2nd	3rd	Arithmetic Mean
1993	ALACHUA	GAINESVILLE/ 721 NW 6TH ST	59	50	35	23
1993		GAINESVILLE/ NW 53AVE & NW 43ST BEHIND FIRE STATION	52	33	32	21
1994		GAINESVILLE/ 721 NW 6TH ST	62	40	40	21
1994		GAINESVILLE/ NW 53AVE & NW 43ST BEHIND FIRE STATION	60	41	38	19
1995		GAINESVILLE/ 721 NW 6TH ST	50	37	37	20
1995		GAINESVILLE/ NW 53AVE & NW 43ST BEHIND FIRE STATION	43	38	33	18
1996		GAINESVILLE/ 721 NW 6TH ST	47	42	28	19
1996		GAINESVILLE/ NW 53AVE & NW 43ST BEHIND FIRE STATION	46	44	41	18
1997		GAINESVILLE/ 721 NW 6TH ST	45	39	38	20
1997		GAINESVILLE/ NW 53AVE & NW 43ST BEHIND FIRE STATION	75	41	39	21
1993	HAMILTON	WHITE SPRINGS/ COUNTY RD 137	151*	56	50	27
1994		WHITE SPRINGS/ COUNTY RD 137	45	40	38	21
1995		WHITE SPRINGS/ COUNTY RD 137	53	48	44	23
1996		WHITE SPRINGS/ COUNTY RD 137	81	62	58	26
1997		WHITE SPRINGS/ COUNTY RD 137	44	43	41	22
		AVERAGE =	54 (24-hour background)			21 (Annual background)

44

*Not included in average

Reference: **FDEP ALLSUM Reports**

TABLE 12 --NOX MONITORING DATA FOR BACKGROUND CONCENTRATIONS

YEAR	COUNTY	MONITOR LOCATION	Concentrations ($\mu g/m^3$) 1-Hour 1st	2nd	Arithmetic Mean
1990	GADSDEN	CHATTAHOOTCHEE/ SCHOLZ S REMOTE	77	66	7
1991		CHATTAHOOTCHEE/ SCHOLZ S REMOTE	66	58	8
1992		CHATTAHOOTCHEE/ SCHOLZ S REMOTE	58	43	7
1993		CHATTAHOOTCHEE/ SCHOLZ S REMOTE	43	43	6
1994		CHATTAHOOTCHEE/ SCHOLZ S REMOTE	34	34	7
1990	JACKSON	SNEADS/ SCHOLZ N REMOTE	652	652	17
1991		SNEADS/ SCHOLZ N REMOTE	58	53	7
1992		SNEADS/ SCHOLZ N REMOTE	39	34	6
1993		SNEADS/ SCHOLZ N REMOTE	36	24	5
1994		SNEADS/ SCHOLZ N REMOTE	71	60	8
				AVERAGE = (Annual background)	8

Reference: FDEP ALLSUM Reports

3.9 Additional Impact Analyses

Federal Secondary Ambient Air Quality Standards are established to protect the public welfare including the protection of animal and plant life, property, visibility and atmospheric clarity, and the enjoyment of life and property.

The U. S. Environmental Protection Agency was directed by Congress to develop primary and secondary ambient air quality standards. The primary standards were to protect human health and the secondary standards were to:

> "... protect the public welfare from any known or anticipated adverse effects of a pollutant."

The public welfare was to include soils, vegetation and visibility.

As a basis for promulgating the air quality standards, EPA undertook studies related to the effects of all major air pollutants and published criteria documents summarizing the results of the studies. The studies included in the criteria documents were related to both acute and chronic effects of air pollutants. Based on the results of these studies, the criteria documents recommended air pollutant concentration limits for various periods of time that would protect against both chronic and acute effects of air pollutants with a reasonable margin of safety.

The facility will not cause or contribute to any exceedance of established ambient air quality standards. The emissions from the facility will result in ambient impacts that are less than significant and are considered to be de minimus, for all regulated pollutants except for PM10 and NOX.

The impacts to ambient air resulting from emissions of PM10 and NOX are well below the applicable Federal Secondary Ambient Air Quality Standards. Compliance with PSD Class II increments establishes an effective ambient air quality standard that is much more stringent than the ambient air quality standards.

It is reasonable to conclude that there will be no adverse effect to the soils or vegetation of the area.

No quantifiable air quality impacts are projected for the area as a result of general commercial, residential, industrial and other growth associated with the facility.

The proposed construction will require an increase in personnel to operate the cement plant. The overall level of activity at the site is expected to be consistent with previous mining activity. No increase in residential or commercial construction is expected in the area surrounding the plant. Therefore, no additional growth impacts are expected as a result of the proposed project.

Okefenokee National Wilderness Area is the only Federal Class I area within 100 kilometers of the facility. No impairment to visibility is expected, as the impacts to ambient air at the Class I area are less than significant.

Visibility is described as one of the air quality related values (AQRV). In the draft May 1996 document *Chassahowitzka Class I Area Study Description,* the Department proposes that only facility allowable emissions of SO2 and NOX in excess of 500 tons per year for facilities located between 50 and 100 kilometers from the Class I area need be evaluated with respect to AQRV.

The proposed facility is approximately 80 kilometers from Okefenokee NWA. As SO2 allowable emissions are well below 500 tons/year, no visibility or other AQRV impacts are expected from SO2 emissions. Likewise, no impairment of AQRV including visibility are expected at Okefenokee NWA from NOX emissions, as the estimated impacts are much less than significant.

3.10 Preconstruction and Postconstruction Monitoring

Department regulations require an analysis of ambient air quality in the area that the facility or modification would affect for each pollutant subject to preconstruction review. This analysis includes:

- For any pollutant for which no national or state ambient air quality standards have been established, such air quality monitoring data as the Department determines are necessary to assess ambient air quality for that pollutant in any area that the emissions of the pollutant would affect; and
- For any pollutant (other than nonmethane hydrocarbons) for which national or state ambient air quality standards have been established, continuous air quality monitoring data sufficient to determine whether emissions of that pollutant would cause or contribute to a violation of any ambient air quality standard or any applicable maximum allowable increase.

The continuous air quality monitoring data are gathered over the twelve-month period immediately preceding the filing of the application for a permit. The requirement for preconstruction air monitoring is met by the use of air quality monitoring data obtained from nearby Department PM10 monitors in Hamilton County and Alachua County.

These data, gathered over an 18-month period prior to July of 1998, are presented in Table 13 – PM10 Preconstruction Monitoring Data.

The Department may require the owner or operator of the facility or modification to conduct postconstruction air quality monitoring and provide the data to the Department if the Department finds that such monitoring is necessary to determine the effect that emissions from the facility or modification may have, or are having, on air quality in any area.

TABLE 13 – PM10 PRECONSTRUCTION MONITORING DATA

PERIOD	MONITOR LOCATION	24-Hour 1st	Concentrations (µg/m³) 2nd	3rd	Arithmetic Mean
1997: January – December,	Alachua County -- 721 NW 6TH ST GAINESVILLE	45	39	38	20
1997: January – December,	Alachua County -- NW 53d AVE. & NW 43d ST., GAINESVILLE	75	41	39	21
1997: January – December,	Hamilton County -- WHITE SPRINGS/ COUNTY RD 137	44	43	41	22
1998: January – June,	Alachua County -- 721 NW 6TH ST GAINESVILLE	78	34	33	22, estimated
1998: January – June,	Alachua County -- NW 53d AVE. & NW 43d ST., GAINESVILLE	71	34	31	21, estimated
1998: January – June,	Hamilton County -- WHITE SPRINGS/ COUNTY RD 137	322	43	34	31, estimated

Reference: FDEP ALLSUM Reports

3.11 Permit Application Information

The application and this report provide the following information to the Department:

- A description of the nature, location, design capacity and typical operating schedule of the facility or modification
- Specifications and drawings showing its design and plant layout
- A detailed schedule for construction of the facility or modification
- Emissions estimates and any other information as necessary to determine that BACT would be applied to the facility
- Information relating to the air quality impact of the facility
- Meteorological and topographical data necessary to estimate such impact
- Information relating to the air quality impacts of, and the nature and extent of, all general commercial, residential, industrial and other growth which has occurred since August 7, 1977, in the area the facility would affect.

The area the facility will affect is the area of significant impact described in the air quality analysis section of this report. This area is within a radius of 7 kilometers from the proposed facility.

A review of Department-permitted air emissions facilities located only three industrial facilities within this radius:

- Anderson Columbia Asphalt Plant
- Anderson Columbia Quarry
- Harlis Ellington Construction Quarry

The relevant air quality impacts of these facilities are evaluated in the air quality analysis section of this report.

General commercial, residential, and other growth within the radius has been minimal since 1977, and is expected to have negligible air quality impacts.

3.12 Good Engineering Practice Stack Height

In accordance with Chapter 62-210, FAC, the degree of emission limitation required for control of any pollutant is not to be affected by a stack height that exceeds GEP, or any other dispersion technique. GEP stack height is defined as the highest of:

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

$$H_g = H + 1.5\,L$$

where:
Hg - GEP stack height,
H - Height of the structure or nearby structure, and
L - Lesser dimension, height or projected width of nearby structure(s)

The 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 higher or lower.

The criteria for good engineering practice stack height in FAC Rule 62-210.550 states that the height of a stack should not exceed the greater of 65 meters (213) feet or the height of nearby structures plus the lesser of 1.5 times the height or cross-wind width of the nearby structure. This stack height policy is designed to prevent achieving ambient air quality goals solely through the use of excessive stack heights and air dispersion. The nearby structure for the plant's main stack is the homogenization silo. The main stack height will be 250 feet (76.3 meters). This stack height and the nearby silo conform to the GEP rule as specified by 62-210.550(3), FAC.

Stack height: 250 feet (76.3 meters)
Blend silo height: 230 feet (70.2 meters)
Blend silo width (diameter): 46 feet (14.03 meters)
Therefore, GEP stack height is described by

Hg =H + 1.5L, or Hg = 70.2 + 21 = 91.2 meters.

The proposed stack height is less than the GEP stack height and will be used for air quality modeling.

3.13 Best Available Control Technology

3.13.1 *General Requirements*

Following receipt of a complete application for a permit to construct a facility that requires a determination of Best Available Control Technology (BACT), the Department shall make a determination of Best Available Control Technology during the permitting process. In making the BACT determination, the Department shall give consideration to:

1. Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169 of the Clean Air Act, 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).

2. All scientific, engineering, and technical material and other information available to the Department.

3. The emission limiting standards or BACT determinations of any other state.

4. The social and economic impact of the application of such technology.

The PSD control technology review requires that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to the source. The BACT requirements are applicable to all regulated pollutants subject to a PSD review.

BACT is defined in FAC Chapter 62-212 as an emission limitation, including a visible emission 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 such pollutant. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead, to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation. Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means that achieve equivalent results.

The reason for evaluating the BACT is to minimize as much as possible the consumption of PSD increments and to allow future growth without significantly degrading air quality. The BACT review also analyzes the control systems utilized in the design of a proposed facility. The BACT, as a minimum, has to comply with the applicable New Source

Performance Standards for the source. The BACT analysis requires the evaluation of the available air pollution control methods including a cost-benefit analysis of the alternatives. The cost-benefit analysis includes consideration of materials, energy, and economic penalties associated with the control systems, as well as environmental benefits derived from the alternatives.

EPA recently determined that the bottom-up approach (starting at NSPS and working up to BACT) was not providing the level of BACT originally intended. As a result, in December 1987, EPA strongly suggested changes in the implementation of the PSD program including the "top-down" approach to BACT. The top-down approach requires a technology evaluation to start with the most stringent control alternative, often Lowest Achievable Emission Rate (LAER), and justify its rejection or acceptance as BACT. Rejection of control alternatives may be based on technical or economical unfeasibility, physical differences, location differences, and environmental or energy impact differences when comparing a proposed project with a project previously subject to that BACT.

Best Available Control Technology (BACT) is required to control air pollutants emitted from newly constructed major sources or from modifications to major emitting facilities if the modifications result in significant increases in the emission rates of regulated pollutants.

The emission rates of particulate matter (PM), particulate matter smaller than 10 microns in diameter (PM10), nitrogen oxides (NOX), sulfur dioxide (SO2), carbon monoxide (CO), and volatile organic compounds (VOC) represent significant emission rates. BACT analyses are therefore required for these pollutants.

3.13.2 *BACT Analysis: Previous BACT Determinations*

A review of the EPA BACT/LAER Clearinghouse identified a number of BACT determinations for Portland cement plants. These recent determinations are listed in Tables 14-18.

TABLE 14 --PREVIOUS PM/PM10 BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	V.E.	CONTROL
LaFarge Corporation	8/97	Kiln/raw mill Cooler	PM10 = 0.11 lb/ton feed PM10 = 0.06 lb/ton feed		Baghouse
Florida Rock Industries	12/96	Kiln Cooler	PM = 0.20 lb/ton feed PM10 = 0.17 lb/ton feed PM = 0.10 lb/ton feed PM10 = 0.09 lb/ton feed	10%	ESP ESP
Fla. Crushed Stone	11/95	Kiln Cooler	PM = 0.2 lb/ton feed PM = 0.1 lb/ton feed		Baghouse
Great Star Cement	10/95	Kiln Cooler	PM10 = 0.13 lb/ton clinker PM10 = 0.11 lb/ton clinker		Baghouse
Roanoke Cement Co.	7/94	Kiln Cooler	PM = 0.40 lb/ton feed PM10 = 0.35 lb/ton feed PM = 0.10 lb/ton feed PM10 = 0.08 lb/ton feed		ESP ESP
Carolina's Cement	8/92	Kiln/cooler	PM = 0.28 lb/ton feed PM10 = 0.23 lb/ton feed	10%	ESP

TABLE 15 --PREVIOUS SO2 BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	CONTROL
LaFarge Corporation	8/97	Kiln/raw mill	4.06 lb/ton clinker	Process
Florida Rock Industries	12/96	Kiln	0.28 lb/ton clinker	Process
Fla. Crushed Stone	11/95	Kiln	0.27 lb/ton clinker	Process
Great Star Cement	10/95	Kiln	0.42 lb/ton clinker	1% sulfur coal
Roanoke Cement Co.	7/94	Kiln	4.99 lb/ton feed	Process
Carolina's Cement	8/92	Kiln/cooler	2.2 lb/ton clinker	Alkaline dust

TABLE 16 --PREVIOUS NOX BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	CONTROL
LaFarge Corporation	8/97	Kiln/raw mill	3.68 lb/ton clinker	Good combustion
Florida Rock Industries	12/96	Kiln	2.8 lb/ton clinker	Combustion practice
Fla. Crushed Stone	11/95	Kiln	2.8 lb/ton clinker	Combustion practice
Great Star Cement	10/95	Kiln	3.1 lb/ton clinker	SNCR
Roanoke Cement Co.	7/94	Kiln	6.00 lb/ton feed	Precalciner
Carolina's Cement	8/92	Kiln/cooler	7.03 lb/ton clinker	Combustion design

Reference for Tables 14-18: EPA BACT/LAER Clearinghouse, November 9, 1998.

TABLE 17 --PREVIOUS CO BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	CONTROL
LaFarge Corporation	8/97	Kiln/raw mill	1.64 lb/ton clinker	Good combustion
Ash Grove	3/97	Kiln	4.34 lb/ton clinker	Good combustion
Puerto Rican Cement Co.	2/97	Kiln	1.74 lb/ton clinker	Combustion controls
Florida Rock Industries	12/96	Kiln	3.6 lb/ton clinker	Good combustion
Fla. Crushed Stone	11/95	Kiln	2.0 lb/ton clinker	Good combustion
Great Star Cement	10/95	Kiln	5.67 lb/ton clinker	Good combustion
Roanoke Cement Co.	7/94	Kiln	2.53 lb/ton feed	Process control
Southdown	2/93	Kiln	3.14 lb/ton clinker	Good combustion
Carolina's Cement	8/92	Kiln	3.99 lb/ton clinker	Combustion design

TABLE 18 --PREVIOUS VOC BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	CONTROL
Puerto Rican Cement Co.	2/97	Kiln	0.12 lb/ton clinker	Combustion controls
Florida Rock Industries	12/96	Kiln	0.12 lb/ton clinker	Process
Roanoke Cement Co.	7/94	Kiln	1.04 lb/ton feed	Precalciner

Reference for Tables 14-18: EPA BACT/LAER Clearinghouse, November 9, 1998.

3.13.3 *Control Technology Analysis: Particulate Matter (PM/PM10)*

Particulate matter (PM/PM10) is generated by the various physical and chemical processes at a cement manufacturing plant. These pollutants are composed of finely dispersed solids. Control of particulate emissions is achieved by the collection of entrained particles from the facility's stack emissions, and by the prevention of generation of particles from fugitive emission sources. Common control devices for stack gases include settling chambers, inertial separators, impingement separators, wet scrubbers, fabric filters, and electrostatic precipitators.

Settling chambers are most effective for controlling larger particles, with control efficiencies of approximately 90% for particles over 40 microns. The overall efficiency of settling chambers is much lower (60%). Settling chambers have not been demonstrated as effective controls at cement plants.

Inertial separators (generally cyclones) can have efficiencies over 90% within narrow particle size ranges, but their overall efficiencies are generally less than 85%. Inertial separators have not been demonstrated as effective controls at cement plants, but they are used extensively as process devices at cement plants. The use of cyclones as process devices at cement plants serves to enhance the overall control efficiency of the system.

Impingement separators and wet scrubbers can achieve particulate removal efficiencies of over 99%. However, these devices have not been demonstrated as effective controls at cement plants. The proposed plant will return all captured particulate to the processing system as raw material, and wetting of the captured particulate would present handling problems. The use of wet scrubbing devices also requires treatment of scrubber liquid.

Fabric filters (baghouses) and electrostatic precipitators (ESP's) are generally considered analogous for particulate control, with both types of devices achieving removal efficiencies of over 99.9%. ESP's and baghouses are used extensively as control devices at cement plants. Baghouses are used to control particulate emissions from most material processing operations at a cement plant.

ESP's and baghouses are considered as BACT and MACT for particulate collection controls for cement plants. The preamble of the recently proposed NESHAP for cement manufacturing (63FR14182, March 24, 1998) states:

> "All kiln exhaust gases are controlled at the existing plants by either [baghouses] or ESPs"

The proposed facility will have baghouses for all controlled material processing operations:

- In-line kiln/raw mill
- Clinker cooler (ESP being evaluated for potential use)

- Raw material, clinker, cement, and solid fuel processing and storage

Baghouses remove dust from a gas stream by passing the stream through a porous fabric. Dust particles form a more or less porous cake on the surface of the fabric. It is normally this cake that actually does the filtration.

The two most common baghouse designs are the reverse-air and pulse-jet types. These names describe the cleaning system used within the design. Certain small baghouses, or nuisance dust collectors, are often of a third type, a shaker system.

Reverse-air baghouses operate by directing the gas stream into the inside of the bags, therefore the filter cake forms on the inside surface of the bags. The bags are cleaned periodically by reversing the flow of air, causing the filter cake to fall from the bags into a hopper below. Typically, reverse-air baghouses are constructed with at least two compartments, to enable on-line cleaning.

Pulse-jet baghouses are designed to allow collection of the dust on the outside of the bags. The filter cake is periodically removed by a pulsed jet of compressed air into the bags.

Shaker baghouses have one end of the bags attached to a fixed frame, and the other end is attached to a frame that can be vigorously shaken, usually by a motor-driven camshaft. During periods when the control device is not in collection mode, the bags are shaken and the filter cake falls into a hopper or into the storage structure (i.e., silo) being controlled.

The selection of fiber material and fabric construction is important to baghouse performance. The fiber material from which the fabric is made must have adequate strength characteristics at the maximum gas temperature expected and adequate chemical compatibility with both the gas stream and the collected dust.

As experience with the use of baghouses has increased, their reliability has increased as a result of the availability of different fibers/fabrics and improvements in the design of bag fabrics and in cleaning techniques. These measures have extended bag life to an average of five years, or more in some cases. Table 19 lists the major fabric alternatives for gas filtration and gives some of the important properties of these fabrics.

TABLE 19 – BAG FABRIC CHART

Fabric	Maximum Temperature, °F	Acid Resistance	Alkali Resistance	Flexural & Abrasion Resistance
Cotton	180	Poor	Good	Very Good
Polypropylene	200	Excellent	Excellent	Very Good
Polyester	275	Good	Good	Very Good
Nomex	400	Poor to fair	Excellent	Excellent
Teflon	450	Excellent	Excellent	Fair
Fiberglass	500	Fair to good	Fair to good	Fair

Air-to-cloth ratio is a measure of the amount of the gas stream driven through the surface area of fabric in the baghouse, and is typically given in terms of the number of cubic feet per minute of gas (acfm) passing through 1 square foot of cloth.

$$\text{Air-to-Cloth Ratio} = [\text{acfm/cloth area (ft}^2)]$$

Typical ranges of air-to-cloth ratios, utilized for various particulate materials, are presented in Table 20.

TABLE 20 – TYPICAL AIR-TO-CLOTH RATIOS

Industry/Material Processed	Typical Air-to-Cloth Ratio Range
Cement	2.0 - 8.0
Clay	2.5 - 9.0
Coal	2.5 - 8.0
Fly Ash	2.5 - 5.0
Gypsum	2.0 - 10.0
Lime	2.5 - 10.0
Limestone	2.7 - 8.0
Rock Dust	3.0 - 9.0
Sand	2.5 - 10.0
Silica	2.5 - 7.0

Raw Material Handling

Purchased and produced raw materials commonly utilize baghouses to control particulate emissions from material storage buildings, enclosures, bins, silos, and conveying equipment. Typical baghouses are pulse-jet, reverse-air, or shaker types. Table 21 presents typical specifications for baghouses used to control particulate emissions from raw material handling in Portland cement plants.

Raw Milling, Pyroprocessing, and Clinker Cooler

Dust collecting devices in the raw mill and raw mix storage areas include baghouses. Air pollution control equipment on the pyroprocessing system includes reverse-air baghouses. Typical control equipment for clinker coolers includes baghouses and ESPs. Table 21 presents typical specifications for baghouses used to control particulate emissions from raw milling, pyroprocessing, and clinker coolers.

Clinker & Cement Handling and Storage

Particulate emissions from mill vents, air separator vents, material handling systems, bins, and silos are typically controlled by baghouses. Typical baghouses are pulse-jet, reverse-air, or shaker types. Table 21 presents typical specifications for baghouses used to control emissions from clinker handling and storage, finish milling, and cement handling and storage.

Coal and Petroleum Coke Milling

Particulate emissions from milling, transfer points, and storage silos/bins are typically controlled by baghouses. Typical baghouses are pulse-jet, reverse-air, or shaker types. Table 21 presents typical specifications for baghouses used to control emissions from coal/petcoke milling and handling.

Fugitive Sources

Common controls to limit particulate emissions from fugitive sources (such as roadways, stockpiles, and material processing/conveying equipment) include wet suppression (to include the processing of wet material), application of surfactants, paving of roadways and covering of stockpiles to reduce wind erosion.

Wet suppression of fugitive particulate emissions is considered as BACT for most material handling operations and unpaved roadways. The paving of roadways is also considered to be a control technique for fugitive particulate emissions. Wind erosion of particles from stockpiles can be limited by the processing of wet material (defined as materials with moisture content > 1.5%), and by the covering of stockpiles where feasible. The application of dust suppressants has not been demonstrated as effective control of fugitive emissions at cement plants.

TABLE 21 – TYPICAL BAGHOUSE SPECIFICATIONS

OPERATION		
Raw material processing	acfm	4500-25,000
	Fabric type	Polyester
	Temperature range, °F	ambient up to 275°
	Air-to-Cloth Ratio	2.5 - 6.0
	Inlet loading, gr/acf	5 - 40
Raw mills, kilns, coolers	acfm	50,000 - 300,000
	Fabric type	Nomex, Fiberglass, Polyester
	Temperature range, °F	180° - 500°
	Air-to-Cloth Ratio	1.5 - 5.0
	Inlet loading, gr/acf	4 - 18
Clinker and cement processing	acfm	2000 - 75,000
	Fabric type	Polyester
	Temperature range, °F	ambient to 275°
	Air-to-Cloth Ratio	2.0 - 6.0
	Inlet loading, gr/acf	5 - 300
Coal and petcoke processing	acfm	3000 - 25,000
	Fabric type	Polyester
	Temperature range, °F	ambient to 275°
	Air-to-Cloth Ratio	2.0 - 6.0
	Inlet loading, gr/acf	5 - 40

3.13.4 *Control Technology Analysis: Sulfur Dioxide (SO2)*

Sulfur dioxide is generated by the combustion of coal and petcoke in the kiln and precalciner burners. Sulfur dioxide control processes can be classified into five categories:

- Fuel/material sulfur content limitations
- Absorption by a solution
- Absorption on a solid bed
- Direct conversion to sulfur
- Direct conversion to sulfuric acid

The only demonstrated SO2 control technologies for cement plants have been process design and material/fuel sulfur limitations. The design of the proposed cement plant allows for effective control of SO2. The kiln, preheater, and raw mill are alkaline environments that enhance the absorption of SO2 into the raw materials. Process design has been demonstrated as BACT for SO2 for cement plants.

A substantial quantity of data was reviewed by Midwest Research Institute for the preparation of AP-42 Fifth Edition, Section 11.6, *Portland Cement Manufacturing*. The documentation contains an analysis of the uncertainty in kiln emission factors, and states:

> "...there is a slight pattern of lower SO2 emission factors with [baghouses] than with ESP's or no controls but the difference may not be significant...".

A significant reduction in SO2 mass will take place in the kiln and preheater environments, with additional reduction in the raw mill. Absorption of SO2 into collected particulate matter may take place in the baghouse, as the gas stream passes through the filter cake.

The projected SO2 removal efficiency of the total system is calculated from the total SO2 available for liberation, as compared to the proposed allowable emission limit.

<u>Coal:</u> 1.5% sulfur by weight, 14.6 tons/hour combusted = 29,200 lbs/hr
Sulfur to sulfur dioxide ratio = 1:2 (2 lbs. SO2 per 1 lb. S)

SO2 from coal combustion =
29,200 lbs. coal/hr X 0.015 lb. S/lb. coal X 2 lbs. SO2/1 lb. S = 876 lbs/hr

<u>Raw Meal:</u>
Sulfite (SO3) from raw meal (typical) = 0.1% by weight
Raw meal is processed at the rate of 163 tons/hour = 326,000 lbs/hr
Sulfite to sulfur dioxide ratio = 5:4 (4 lbs. SO2 per 5 lbs. SO3)

SO2 from raw meal =
326,000 lbs/hr X 0.001 lbs. SO3/lb X 4 lbs. SO2/5 lbs. SO3 = 261 lbs/hr
Total SO2 from coal and raw meal = 876 + 261 = **1137 lbs/hr**

Proposed SO_2 emission limit = 26.83 lb/hr

Estimated SO_2 removal from total system:
100 % - [(26.83 lbs/hr emitted/1137 lbs/hr liberated) X 100%] = **97.6%**

3.13.5 *Control Technology Analysis: Nitrogen Oxides (NOX)*

Nitrogen oxides are formed in the combustion process by the oxidation of nitrogen in fuels (fuel NOX) and in combustion air (thermal NOX). Thermal NOX is formed from the reaction of oxygen and nitrogen in the combustion air at combustion temperatures. Formation of thermal NOX depends on the flame temperature, residence time, combustion pressure, and air-to-fuel ratio in the combustion zone. The design and operation of the combustion system dictates these conditions. Fuel NOX is created by the oxidation of the volatilized nitrogen in the fuel. Nitrogen content of the fuel is the primary factor in the formation of fuel NOX. It has been shown that thermal NOX is the dominant type of NOX emitted from cement plants.

The emissions of nitrogen oxides can be lowered by lowering combustion temperatures and reducing combustion air. These measures, however, do increase the generation of carbon monoxide. Post combustion controls have been proposed for certain sources where reduction of nitrogen oxides has been required. The source categories for which the "add-on" controls have been proposed or recommended include municipal waste combustors, industrial and utility boilers, glass furnaces, and gas turbines. The add-on controls used in the above applications typically consist of Selective Catalytic Reduction (SCR) technology or Selective Non-Catalytic Reduction (SNCR) technology.

No add-on NOX controls have been demonstrated as effective for cement plants. Proper operation practices are used by all the cement kilns in the country as the method of achieving low emissions of nitrogen oxides. It is widely recognized that the emissions of nitrogen oxides can be controlled by limiting the amount of excess combustion air supplied to the combustion process. However, it should be noted that there is a relationship between the emissions of nitrogen oxides and carbon monoxide, where the emissions of carbon monoxide increase dramatically as the emissions of nitrogen oxides are reduced. At optimum operating conditions, the generation of both pollutants can be minimized.

NOX emissions will be limited through three approaches: Process design, indirect firing system, and staged combustion. These approaches are discussed further below.

<u>PROCESS DESIGN</u>

Preheater and precalciner kilns have lower NOX emission rates than long dry kilns and wet process kilns, due to higher fuel efficiency and lower firing rates in the kiln firing zone (discharge end burner). Secondary combustion of fuel is inherent in precalciner kilns, and combustion characteristics in the kiln firing zone and precalciner firing zones differ substantially. The very high temperature and fuel-lean conditions in the kiln firing zone contribute to higher NOX formation rates than in the precalciner firing zone, which has moderate flame temperature and fuel-rich conditions. In the proposed facility, approximately 40% of the fuel will be burned in the kiln, and 60% will be burned in the precalciner.

<u>INDIRECT FIRING SYSTEM:</u> An indirect fired system has separate coal pulverizing and firing circuits. This system is often used where there is a single coal mill unit with multiple

firing points (precalciner kilns), or high moistures in the coal to be milled. The significant features of this system are:

- All or most of the coal mill discharge gases are vented to the atmosphere.
- Milled coal is stored in bins for a short period of time before it is delivered to the firing points.
- Short interruptions in coal mill operation will not affect kiln operation.
- This type of system has the lowest overall heat consumption.
- Since milling and drying gases are separated from coal firing, inert (low oxygen) clinker cooler exhaust gases can be used as coal mill drying gases.
- A low volume of air is used to transport the milled coal to the firing points, allowing maximum use of high temperature air from the clinker cooler for drying in the mill.
- Primary air supplied to the kiln burner (discharge end) can be optimized with an indirect system (10%-12% primary air).

The thermal efficiencies of the indirect firing system result from the utilization of otherwise waste heat from the clinker cooler exhaust gases. This negates the need for an additional hot air source for coal drying, and precludes any NOX emissions from the combustion of additional fuel. Additionally, an indirect firing system increases overall energy efficiency by allowing a greater proportion of clinker cooler exhaust air as secondary combustion air.

<u>STAGED COMBUSTION:</u> Staging of combustion air allows combustion of fuel to proceed in two distinct zones. The staged combustion is typically achieved by using only a part of the combustion air (primary air) for fuel injection in the flame zone with remaining secondary air being injected in a subsequent cooler zone.

In the first zone, the initial combustion is conducted in a primary, fuel-rich zone. This zone provides the high temperatures necessary for completion of the clinkering reactions. NOX formation in this zone is minimized by limiting excess oxygen available for combustion. The air used for conveying the milled coal from the coal mill is called primary air. The indirect firing system as described above can effectively limit the amount of primary air at each burner. A cement kiln using 10 to 12 percent of primary air is described as an indirect fired kiln.

The second combustion zone is characterized by lower temperatures and fuel-lean conditions as a result of excess available oxygen from secondary air. The temperature in this second zone is much lower than the first zone because of mixing with the cooler secondary air. The formation of NOX is thus minimized in spite of the excess available oxygen in the second zone.

The secondary air for both burners is ducted from the clinker cooler maximizing the overall thermal efficiency of the process. The secondary air for the precalciner burner is ducted via the tertiary air duct.

3.13.5.1 *Top-Down Best Available Control Technology Analysis: NOX*

STEP 1 – Identify all control technologies
NOX control approaches applicable to the cement industry may be grouped in two categories:

I. Combustion control approaches where the emphasis is on reducing NOX formation:

-Fuel denitrification
-Fuel reburning per Energy and Environmental Research Corporation
-Process control
-Low NOX burners
-External flue gas recirculation
-Secondary combustion of fuel

II. Post combustion control approaches that control the NOX formed in the combustion process:

-Selective catalytic reduction (SCR)
-Selective non-catalytic reduction (SNCR)

STEP 2 – Eliminate technically infeasible options
Fuel denitrification: Seemingly, fuel denitrification of coal and heavy oils could be used to control nitrogen oxide emissions, but current technology is limited.
(Page 4.50, *Handbook of Environmental Engineering,* McGraw-Hill, 1990)

Fuel reburning per Energy and Environmental Research Corporation: This technology is not considered available for cement kilns. This technology would require bench scale and pilot scale testing before use in a cement kiln.
(Telephone conversation with Michael Booth, EER, April 24, 1995)

External flue gas recirculation: The concept of external flue gas recirculation for NOX reduction has not been demonstrated in cement kilns.
(United States Environmental Protection Agency, *Alternative Control Techniques Document - NOX Emissions from Cement Manufacturing*, EPA-453/R-94-004, 3/1994)

STEP 3 – Rank remaining control technologies
The remaining control technologies are:

-Process control
-Low NOX burners
-Secondary combustion of fuel
-Selective catalytic reduction (SCR)
-Selective non-catalytic reduction (SNCR)

Process Control: The use of the monitoring and feedback control approach is considered as BACT, and will be used at this plant.

Secondary Combustion of Fuel: Secondary combustion of fuel is inherent in all precalciner kilns and preheater kilns with riser duct firing and such kilns produce less NOX emissions than long dry kilns. The plant has a precalciner, and will therefore utilize secondary combustion of fuel as a NOX control technique.

The remaining control technologies to be ranked by control effectiveness are:

-Low NOX burners
-Selective catalytic reduction (SCR)
-Selective non-catalytic reduction (SNCR)

STEP 4 – Evaluate remaining control technologies

Selective Catalytic Reduction: This control technology involves adverse economic, environmental, and energy impacts; thus, it is rejected as BACT.

Economic Impacts: The use of SCR would result in an average cost effectiveness of $4043 per ton of NOX removed. A review of recent BACT determinations for NOX from cement plants showed no use of SCR. Hence the costs for NOX removal using SCR are disproportionately high when compared to the costs of controls for NOX emissions from other cement plants in recent BACT determinations.

Environmental Impacts: The use of SCR would require the handling and storage of ammonia or similar materials at the facility, with an attendant risk of environmental degradation. The SCR system also would increase ammonia emissions from the stack, due to "ammonia slip". Additionally, any spent catalyst would present a hazardous waste or solid waste problem.

Energy Impacts: Because of problems related to catalyst fouling, a SCR system would need to be installed downstream of the particulate control device. Since the SCR process requires the gas temperature to be about 750 to 930 °F, the gas stream would need to be reheated causing an additional energy cost. With an energy recuperative type process heater with an energy recovery of 60 percent the energy requirement for the flue gas reheating would be approximately 10 percent of that consumed in the cement manufacturing.

Selective Non-Catalytic Reduction: This control technology involves adverse economic and environmental impacts. This technology has not been effectively demonstrated in long-term operation in a cement kiln, therefore it is not considered as available. Thus, SNCR is rejected as BACT.

Availability: A review of recent BACT determinations for NOX from cement plants showed only one plant with SNCR. It is unclear as to whether that plant has demonstrated long-term operation using SNCR – no startup date is given in the BACT/LAER Clearinghouse, and the record was last updated in February of 1996. Interestingly, the BACT emission limit for NOX (3.1 lb/ton of clinker) is higher than the rate proposed as BACT in this application.

Economic Impacts: The use of SNCR would result in an average cost effectiveness of $1216 per ton of NOX removed. Hence, the costs for NOX removal using SNCR or any add-on controls are disproportionately high when compared to the costs of controls for NOX emissions from other cement plants in recent BACT determinations.

Environmental Impacts: The use of SNCR would require the handling and storage of ammonia or similar materials at the facility, with an attendant risk of environmental degradation. The SNCR system also would increase ammonia emissions from the stack, due to "ammonia slip".

Low NOX Burners: This control technology involves adverse economic impacts and questionable environmental and energy impacts; thus, it is rejected as BACT.

Low NOX burners result in lower flame temperatures and less thermal NOX formation. The same advantages are achieved through staged combustion (from the indirect firing system), secondary combustion of fuel (in the precalciner), and process controls associated with the proposed plant.

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.

Economic Impacts: The use of low NOX burners would result in an average cost effectiveness of $1050 per ton of NOX removed. A review of recent BACT determinations for NOX from cement plants showed no add-on controls. Hence, the costs for NOX removal using low NOX burners or any add-on controls are disproportionately high when compared to the costs of controls for NOX emissions from other cement plants in recent BACT determinations.

Environmental Impacts: The effectiveness of a low NOX burner was tested in a cement kiln in the United States in 1984. The results of these tests were not considered conclusive in evaluating the NOX reduction potential of a low NOX burner. Further, it is unclear as to the effects on CO and VOC emissions as a result of the use of a low NOX burner.

Energy Impacts: No data are available to determine the energy impacts of the low NOX burner technology.

STEP 5 – Select BACT

BACT for NOX control for the plant is proposed as indirect firing, process control and secondary combustion of fuel.

Process Control: The use of the monitoring and feedback control approach is considered as BACT, and will be used at this plant.

Secondary Combustion of Fuel: Secondary combustion of fuel is inherent in all precalciner kilns and such kilns produce less NOX emissions compared to long dry kilns. The plant has a precalciner, and will therefore utilize secondary combustion of fuel as a NOX control technique.

3.13.6 *Control Technology Analysis: Carbon Monoxide (CO)*

Carbon monoxide is formed as an intermediate product of the chemical reaction between carbonaceous fuels and oxygen. When an insufficient quantity of oxygen is provided, CO occurs as a product of the combustion process. CO may originate in high-temperature regions of the combustion zone, where chemical equilibrium dictates that dissociation of CO_2 into CO should occur. Therefore, the effects of fuel-air ratio, degree of mixing, and temperature may lead to significant CO formation in the hot combustion zone.

The calcining of limestone in the cement manufacturing process liberates large amounts of CO_2, which is available for dissociation into CO. Carbon monoxide, unlike other major gaseous pollutants, does not lend itself to exhaust gas removal techniques. The most productive approach is the control of CO formation. This presents a difficult situation, because the control techniques for reducing NOX and CO are in conflict.

No add-on controls for CO have been demonstrated for cement plants. Process control, process design, and combustion unit design have been determined as BACT for cement plants. Combustion control is proposed as BACT for this plant.

3.13.7 *Control Technology Analysis: Volatile Organic Compounds (VOC)*

VOC can be controlled by add-on control devices by the mechanisms of adsorption, absorption, or incineration (afterburning). Incineration processes include flame incineration, thermal incineration, and catalytic incineration.

No add-on controls have been demonstrated for VOC emissions from cement plants. Combustion control, which can limit the products of incomplete combustion (PIC's), has been determined as BACT for VOC control. Process control, process design, and combustion unit design have been determined as BACT for cement plants. Combustion control is proposed as BACT for this plant.

The preamble of the recently proposed NESHAP for cement manufacturing (63FR14182, March 24, 1998) states:

> "Methods used in the cement manufacturing industry for the control of organic HAP emissions would be the same methods used to control [VOC] emissions. These emission control methods include using feed materials with relatively low levels of organic matter and achieving good combustion."

3.14 Proposed BACT

Based on a review of previous BACT determinations and the proposed Maximum Achievable Control Technology (MACT) for the Portland cement manufacturing industry, proposed BACT controls and limits are shown in Table 22. The pollutants PM, PM10, SO2, NOX, CO, and VOC are subject to BACT.

TABLE 22 --PROPOSED BACT LIMITS

POLLUTANT	OPERATION	EMISSION LIMIT	V.E.	CONTROL
Particulate Matter (PM)	Kiln/raw mill Cooler Material processing	0.20 lb/ton dry preheater feed 0.10 lb/ton dry preheater feed 0.01 gr/dscf	10% 10% 5%	Baghouse Baghouse Baghouses
Particulate Matter (PM10)	Kiln/raw mill Cooler Material processing	0.17 lb/ton dry preheater feed 0.09 lb/ton dry preheater feed 0.009 gr/dscf	10% 10% 5%	Baghouse Baghouse Baghouses
Sulfur Dioxide (SO2)	Kiln	0.28 lb/ton clinker		Process
Nitrogen Oxides (NOX)	Kiln	3.8 lb/ton clinker (two years after startup) 2.8 lb/ton clinker (thereafter)		Indirect firing Good combustion
Carbon Monoxide (CO)	Kiln	3.6 lb/ton clinker		Good combustion
Organic Compounds (VOC)	Kiln	0.12 lb/ton clinker		Good combustion

4.0 CONCLUSION

It can be concluded from the information in this report that the proposed allowable emission rates of particulate matter (PM), particulate matter (PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), and volatile organic compounds (VOC) from the Suwannee American Cement Company cement plant as described in this report will not cause or contribute to a violation of any air quality standard, PSD increment, or any other provision of Chapter 62-212, FAC.

ATTACHMENT 1

FACILITY PLOT PLAN

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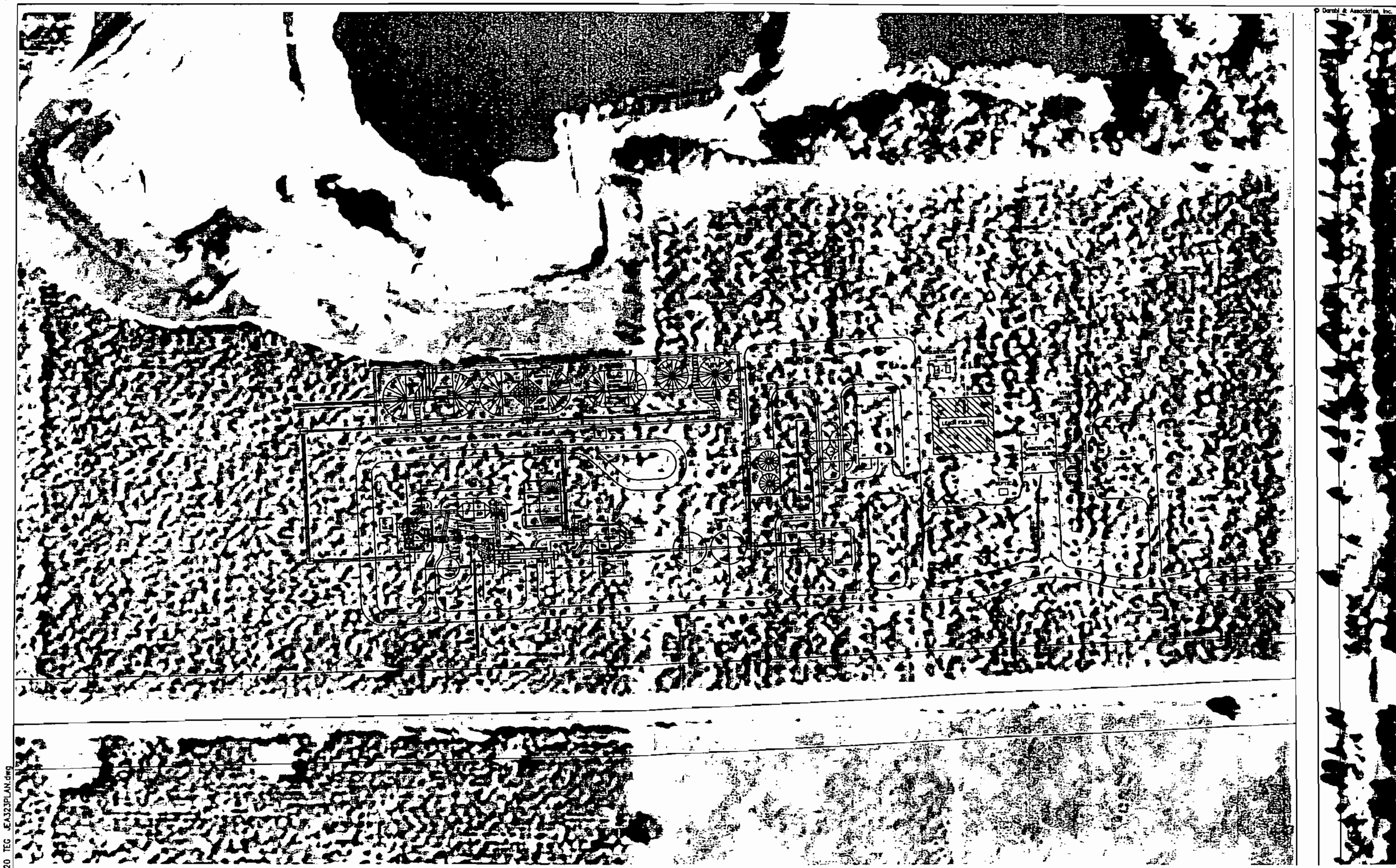

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED DAK
DRAWN TEG
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DAVID A. KEOUGH, P.E.
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AMERICAN CEMENT COMPANY

CONCEPTUAL PLAN A

APPROVED FOR D&A BY
DAVID A. KEOUGH, P.E.
REG. PROF. ENGINEER

DATE OCT 1998
SCALE AS SHOWN
PROJECT NO. 04100-323-01
DWG. NO. 1 OF 2

ATTACHMENT 2

PROCESS FLOW DIAGRAM

EQUIPMENT LIST

Chapter C -- Raw Material Transport.

Equipment Number	Quantity	Description
C-01		OPEN NUMBER
C-02	One (1)	Belt Conveyor with Tripper and Belt Scale

Complete with supports, channel stringer frame and truss, bents, walkways, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required. The transfer tower design and supply is by the contractor.

Capacity	:	1000 stph (Operating) 1330 stph (Design)
Width	:	42"
Horizontal Length	:	857 ft.
Vertical Lift	:	54 ft.
Belt Speed	:	400 fpm
Travel Speed (Tripper)	:	40 fpm
Motor Size (Belt Conveyor)	:	150 hp
Motor Size (Tripper)	:	2 hp

C-03	One (1)	PGNAA Analyzer (Polysius CNA)

To analyze quarried and crushed raw materials delivered to the stacker/reclaimer facility.

C-04	One (1)	Covered Storage (By Contractor)

For storage of quarry mix containing two (2) piles of 16,800 stons each, plus iron ore, sand, coal ash and limestone.

Storage Building:

Length	:	800'-0"
Width	:	135'-0" (Inside Columns)
Height (Roof)	:	80'-0"

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November 24, 1998

EQUIPMENT LIST

Chapter C -- Raw Material Transport.

Equipment Number	Quantity	Description		
		Data for Quarry Mix:		
		Pile Width	:	102 ft.
		Pile Height	:	43 ft.
		Total Pile Length	:	420 ft.
		Bulk Density	:	100 lbs/ft^3
		Angle of Repose	:	40°
C-05	One (1)	Reclaimer		
		Reclaims the quarry mix at grade level for delivery to the raw grinding facility.		
		Reclaiming Capacity	:	250 stph
		Chain Speed	:	138 fpm
		Travelling at Speed:		
		At Reclaiming	:	0.3 fpm
		At No-Load Run	:	30 fpm
		Speed of Rake	:	15 fpm
		Rake Travel	:	15 ft
		Runner Wheel Diameter	:	21"
		Rail Gauge	:	117 ft
		Number of Wheels	:	4
		Thereof Driven	:	2
		Rails (by others)	:	CR 135
		Motor Size (Scraper Chain)	:	75 hp
		Motor Size (Rake Device)	:	7.5 hp
		Motor Size (Travel Drive Slow)	:	2 x 0.3 hp
		Motor Size (Travel Drive Fast)	:	2 x 2 hp
C-06 through C-96		OPEN NUMBERS		
C-97	One (1) Set	Chutes for Chapter "C"		
C-98 thru C-99		OPEN NUMBERS		

EQUIPMENT LIST

Chapter D -- Raw Material Transport & Feed Bins

Equipment Number	Quantity	Description
D-01	One (1)	Belt Conveyor with Belt Scales

To receive raw material from reclaim system and transport to roller mill feed bin belt conveyor D-02, with material flow monitoring.

Complete with supports, channel stringer frame and truss, bent, walkway, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required. The transfer tower design and supply is by the contractor.

Capacity	:	450 stph (Operating)
		600 stph (Design)
Width	:	30"
Horizontal Length	:	871' – 6"
Vertical Lift	:	9' – 3"
Belt Speed	:	370 fpm
Motor Size	:	50 hp

Equipment Number	Quantity	Description
D-02	One (1)	Belt Conveyor

To receive raw material from Belt Conveyor D-01, and transport to Belt Conveyor D-03.

Complete with supports, channel stringer frame and truss, bents, walkways, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required. The transfer tower design and supply is by the contractor.

Capacity	:	450 stph (Operating)
Capacity	:	600 stph (Design)
Width	:	30"
Horizontal Length	:	410 ft.
Vertical Lift	:	88 ft.
Belt Speed	:	380 fpm
Motor Size	:	100 hp

EQUIPMENT LIST

Chapter D -- Raw Material Transport & Feed Bins

Equipment Number	Quantity	Description
D-03	One (1)	Belt Conveyor

To receive raw material from Belt Conveyor D-02, and transport to Belt Conveyor D-10.

Complete with supports, channel stringer frame and truss, bents, walkways, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required. The transfer tower design and supply is by the contractor.

Capacity	:	450 stph (Operating)
Capacity	:	600 stph (Design)
Width	:	30"
Horizontal Length	:	230 ft.
Vertical Lift	:	50 ft.
Belt Speed	:	390 fpm
Motor Size	:	50 hp

EQUIPMENT LIST

Chapter D -- Raw Material Transport & Feed Bins

Equipment Number	Quantity	Description
D-04	One (1)	Reclaim Hopper for Iron Ore/Coal Ash (By Contractor)

To receive iron ore or coal ash from front-end loader for transportation to raw mill grinding system.

Capacity	:	19 st (Iron Ore) 6 st (Coal Ash)
Size	:	3'-4" Wide 17'-0" Long 6'-0" High

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EQUIPMENT LIST

Chapter D -- Raw Material Transport & Feed Bins

Equipment Number	Quantity	Description
D-05	One (1)	Weighbelt Feeder

Regulates iron ore/coal ash withdrawal from Hopper D-04 to Belt Conveyor D-01.

Complete with supports, channel stringer frame, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required.

Capacity	:	2.5 - 25 stph
Feeder Width	:	36"
Feeder Length	:	24 ft.
Motor Size	:	3 hp

D-06	One (1)	Reclaim Hopper for Sand (By Contractor)

To receive sand from front-end loader for transportation to raw mill grinding system.

Capacity	:	18 st
Size	:	3'-4" Wide 17'-0" Long 6'-0" High

D-07	One (1)	Weighbelt Feeder

Regulates sand withdrawal from Hopper D-06 to Belt Conveyor D-01.

Complete with supports, channel stringer frame, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required.

Capacity	:	2.5 - 25 stph
Feeder Width	:	36"
Feeder Length	:	24 ft.
Motor Size	:	3 hp

EQUIPMENT LIST

Chapter D -- Raw Material Transport & Feed Bins

Equipment Number	Quantity	Description
D-08	One (1)	Reclaim Hopper for Limestone (By Contractor)

To receive limestone from front-end loader for transportation to raw mill grinding system.

Capacity	:	15 st
Size	:	3' - 4" wide 17' - 0" long 6' - 0" high

D-09	One (1)	Weighbelt Feeder

Regulates limestone withdrawal from Hopper D-08 to Belt Conveyor D-01.

Complete with supports, channel stringer frame, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required.

Capacity	:	2.5 - 25 stph
Feeder Width	:	36"
Feeder Length	:	24 ft.
Motor Size	:	3 hp

EQUIPMENT LIST

Chapter D -- Raw Material Transport & Feed Bins

Equipment Number	Quantity	Description
D-10	One (1)	Belt Conveyor

To receive raw material from Belt Conveyor D-03, and transport to Roller Mill Feed Bin D-12.

Complete with supports, channel stringer frame and truss, bents, walkways, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required. The transfer tower design and supply is by the contractor.

Capacity	:	450 stph (Operating)
Capacity	:	600 stph (Design)
Width	:	30"
Horizontal Length	:	70 ft.
Vertical Lift	:	9 ft.
Belt Speed	:	400 fpm
Motor Size	:	10 hp

D-11	One (1)	Diverter Gate

Pneumatically operated.

Size	:	24" x 24"

D-12	One (1)	Feed Bin

To receive raw material from Belt Conveyor D-10 before feeding to raw grinding. Bin is of tapered design.

Capacity	:	90 st
Volume	:	2,340 ft^3
Width	:	5 ft. 6 in.
Height	:	34 ft.
Length	:	12 ft.

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EQUIPMENT LIST

Chapter D -- Raw Material Transport & Feed Bins

Equipment Number	Quantity	Description
D-13	One (1)	Self-Cleaning Magnet To remove ferrous tramp metal objects on Belt Conveyor D-02 prior to entering the roller mill feed system. Motor Size : 2 hp
D-14	One (1)	Metal Detector To stop Belt Conveyor D-10, mark metallic objects not removed by the Self-Cleaning Magnetic Separator remaining on the belt and to sound an alarm.
D-15 through D-96		OPEN NUMBERS
D-97	One (1) Set	Chutes for Chapter "D"
D-98 thru D-99		OPEN NUMBERS

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EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-01	One (1)	Chain Feeder

Regulates raw material withdrawal from Bin D-12 to roller mill.

Capacity	:	270 stph (Operating) 300 stph (Design)
Feeder Width	:	67 in.
Feeder Length	:	25'-5"
Motor Size	:	60 hp

E-02	One (1)	Air Heater

To be utilized when the moisture content of the raw meal exceeds 10% at 192 stph.

Fuel	:	No. 2 Oil
Heating Capacity:	:	32 MBTU/hr
Inlet Temp.	:	68°F
Outlet Temp.	:	1832°F
Air Fans (Combustion and Dilution)		
Capacity	:	15,100 acfm
Pressure	:	4.5" WC
Motor Size	:	20 hp / 30 hp

E-03 through E-08		OPEN NUMBERS
E-09	One (1)	Roller Mill Water Injection System

To regulate the mill temperature and provide moisture to the material to be ground if a longer residence time on the mill table is needed.

E-10	One (1)	Tramp Iron Separator

To remove tramp metal from ground material prior to entering dynamic air separator.

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description		
E-11	One (1)	Polysius Roller Mill		
		To grind raw materials in preparation for pyro-processing in the rotary kiln.		
		Includes mill housing, grinding table, two roller pairs, complete drive system, bearings, lubrication, seal air fans, hydraulic tensioning system, oil cooler, and guards.		
		For detailed description, see *Major Equipment Specifications.*		
		Type of Mill	:	Roller Mill with Dynamic Separator
		Feed Rate	:	192 stph (dry)
		Feed Material	:	Raw Material
		Size of Mill	:	RM 41/20
		Speed of Mill	:	26.7 rpm
		Main Motor Size	:	1750 hp
	One (1)	Hydraulic Drive System		
		Motor Size	:	2 x 15 hp
	Two (2)	Seal Air Fans		
		Motor Size	:	2 x 3 hp
	Two (2)	Oil Pumps		
		Motor Size	:	2 x 30 hp
	One (1)	High Pressure Lubrication		
		Motor Size	:	4 x 7.5 hp
	One (1)	Auxiliary Drive		
		Motor Size	:	50 hp

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-12	One (1)	Dynamic Separator

To separate the finely ground usable raw meal from the coarsely ground unusable material which is returned to the roller mill for further grinding.

Includes separator housing, rotor, hydraulic drive unit, and guards.

Separator Type	:	SEPOL-RMS-315
Speed of Rotor	:	1-90 rpm
Motor Size	:	125 hp
Rotor Diameter	:	10'-4"

One (1) Cooling Fan

Motor Size	:	10 hp

One (1) Oil Pump

Motor Size	:	150 hp

E-13	One (1)	Roller Pair Service Hoist

To facilitate maintenance removal and replacement of roller mill roller pairs.

Capacity	:	25 st
Motor	:	30 hp

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-14	One (1)	Bucket Elevator

To transfer ground material discharged from the Roller Mill, E-11 back to the mill inlet.

Complete with casing, head assembly, boot assembly, segmental rim traction wheel, internal gravity take-up, conveying chain, buckets, drive, backstop, guards and inching drive.

Capacity	:	144 stph (Operating) 192 stph (Design)
Center Distance	:	85 ft.
Motor Size (Main)	:	30 hp
Motor Size (Inching)	:	3 hp

Equipment Number	Quantity	Description
E-15	One (1)	Diverter Gate

Manual gate to allow emptying of the roller mill system.

Size	:	24"

Equipment Number	Quantity	Description
E-16	Two (2)	Cyclones

To remove a majority of the finely ground material from the circulating air of the Mill Separator E-12 and transfer to Air Gravity Conveyors F-01.

Each consists of cylindrical upper housing and a conical lower housing. The dust laden air enters the cyclone by a tangentially located inlet, and the cleaned air leaves by a central outlet duct. The lower housing which contains a manway is open at bottom for removal of the generated dust. Support brackets are supplied loose for field welding.

Air Volume	:	195,000 acfm (total)
Diameter of Cyclones	:	16'-5"

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-17	Two (2)	Rotary Airlocks

To seal against the negative pressure inside the cyclones and to allow the produced raw meal to be discharged.

Complete with cast iron housings, cast steel liners, rotors with spring steel blades supported in antifriction bearings and chain drives.

Capacity	:	115 stph (each)
Motor Size	:	2 x 5 hp
Speed of Valve	:	20 rpm
Valve Size	:	26 x 26

Equipment Number	Quantity	Description
E-18	One (1)	Mill Fan

To induce air flow through the roller mill, dynamic separator, and cyclones for the purpose of drying the raw materials and transporting the product meal.

Complete with flanged inlet and outlet, inspection doors, drain, sole plates for bearings, coupling, coupling guard and motor-operated damper.

Gas Flow	:	200,000 acfm
Temperature	:	230°F
Static Pressure	:	-38 in. W.G.
Fan Speed	:	880 rpm
Motor Size	:	1500 hp

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-19	One (1)	Kiln/Mill Baghouse

To collect dust from the kiln/mill system.

Complete with ten modules, tube sheets, hoppers, filter bags, support cages, compressed air headers, pulse pipes, pulse valves, inlet and outlet plenum and dampers, support structure, access walkway, penthouse enclosure, stairs, ten airlocks and three screw conveyors.

Gas Flow	:	200,000 acfm
Temperature	:	300°F
Pressure @ Inlet	:	-3" W.G.
Inlet Dust Load	:	25 gr/acf
Bags	:	Gortex Membrane Teflon B Fiberglass Fabric 16.8 oz/yd^2
Air to Cloth Ratio		
Normal Operation On-Line Cleaning	:	< 3.2:1 ft/min.
One Module Off for Maintenance	:	< 3.6:1 ft/min.
Outlet Dust Loading	:	0.01 gr/dscf
Max. Pressure Drop Across Baghouse	:	-6" W.G.
Design Casing	:	-20" W.G.

	One (1)	Rotary Screw Conveyor

To provide compressed air for the kiln/mill baghouse.

Capacity	:	892 acfm
Pressure	:	125 psig
Motor Size	:	200 hp

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-20	One (1)	Kiln/Mill Baghouse Fan

To exhaust the baghouse.

Complete with flanged inlet and outlet, inspection door, casing draw, split housing, shaft seal, heat flinger, inlet boxes, two inlet dampers with one Beck actuator, coupling guard and split housing.

Air Volume	:	220,000 acfm (Design)
Temperature	:	356°F
Static Pressure	:	-12" W.G.
Motor Speed	:	1200 rpm
Motor Size	:	700 hp
Dust Loading	:	.01 gr/cf

E-21	One (1)	Exhaust Gas Stack (By Contractor)

To exhaust waste gasses to the atmosphere.

Steel stack complete with steel stack, inspection door, aerial warning lights, and instrumentation platform with access ladder.

Stack Diameter	:	12'-0"
Stack Height	:	250 ft.

E-22	One (1)	Pneumatic Screw Pump

Conveying Rate	:	30 stph
Motor Size	:	20 hp

E-23	One (1)	Compressor

To provide compressed air for operation of Pneumatic Screw Pump E-22.

Capacity	:	855 scfm
Air Pressure	:	10 psig
Motor Size	:	60 hp

Note: Piping between compressor and screw pump by contractor.

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-24	One (1) Lot	Material Conveying Line (By Contractor)

Pipe and fittings to provide pneumatic conveying line from Screw Pump E-22 to the Alleviator E-25.

Pipe Diameter	:	6"
Max. Conveying Distance	:	200 ft.
Horizontal	:	140 ft.
Vertical	:	60 ft.

E-25 One (1) Alleviator

To vent the Pneumatic Screw Pump E-22.

Vessel Diameter	:	17 ft

One (1) Rotary Airlock

To seal against the negative pressure inside the alleviator and to allow the baghouse dust to be discharged.

Complete with cast iron housings, cast steel liners, rotors with spring steel blades supported in antifriction bearings and chain drives.

Capacity	:	25 stph
Motor Size	:	2 hp
Speed of Valve	:	13 rpm
Valve Size	:	22 x 22 in.

E-26 OPEN NUMBER

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-27	One (1)	Screw Conveyor

To receive dust from Distribution Box E-30 and transfer to Air Gravity Conveyor H-01.

Complete with conveyor troughs, screws with solid helicoid flights, drive and drive guard.

Capacity	:	7.5 stph
Screw Diameter	:	20"
Length	:	28'-5"
Motor Size	:	30 hp

E-28	One (1)	Dust Collector and Fan

To ventilate Alleviator E-25, AGC F-03 and AEROPOL F-04.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment, discharge hopper and supports. Also includes fan and rotary airlock.

Air Volume	:	3,000 acfm

	One (1)	Collector Fan

To exhaust the dust collector.

Air Volume	:	3,000 acfm
Air Temperature	:	300°F
Static Pressure	:	10" W.G.
Motor Size	:	-10 hp

	One (1)	Rotary Airlock

To discharge dust from the dust collector.

Motor Size	:	1/2 hp

E-29		OPEN NUMBER

EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description		
E-30	One (1)	Distribution Box		
		To distribute baghouse dust to three different feed points.		
E-31	One (1)	Aeration Blower for Distribution Box		
		Air Delivery	:	181 scfm
		Air Pressure	:	3 psi
		Motor Size	:	5 hp
E-32	One (1)	Manual Slide Gate		
E-33	One (1)	Vent box with Deflector Plate		
E-34	One (1)	Rotary Airlock Feeder		
		Capacity	:	20 stph
		Size	:	16 in.
		Motor Size	:	1.5 hp
E-35	One (1)	Blow-Through Adaptor		
E-36	One (1)	Aeration Blower for Conveying		
		Air Delivery	:	862 scfm
		Air Pressure	:	5.5 psi
		Motor Size	:	40 hp
E-37	One (1) Lot	Material Conveying Line (By Contractor)		
	One (1)	Expansion Joint at Discharge		
E-38	One (1)	Slide Gate (Pneumatically Operated)		
E-39	One (1)	Discharge for Distribution Box		
		Size	:	8 in.
E-40	One (1)	Slide Gate (Pneumatically Operated)		

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EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description		
E-41	One (1)	Discharge for Distribution Box		
		Size	:	8 in.
E-42		OPEN NUMBER		
E-43	One (1)	Manual Slide Gate		
E-44	One (1)	Discharge for Distribution Box		
		Size	:	8 in.
E-45	One (1)	Rotary Airlock Feeder		
		Capacity	:	20 stph
		Size	:	18 in.
		Motor Size	:	2 hp
E-46 through E-86		OPEN NUMBERS		
E-87-01	One (1)	Hoist Beam for 20 st Hoist (By Contractor)		
		For moving E13-01 Hoist Beam and Hoist.		
E-88-01	One (1)	Hoist Beam for 10 st Hoist over Mill (By Contractor)		
E-89-01	One (1)	Hoist Beam for 7.5 st Hoist over Bucket Elevator (By Contractor)		
E-90 through E-93		OPEN NUMBERS		

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EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description
E-94	One (1) Lot	Refractory Supply and installation by Owner's Subcontractor. - Duct from Air Heater E-02 to Roller Mill Inlet. Installation only by Owner's Subcontractor. - Air Heater E-02.
E-95	One(1) Lot	Insulation Supply and installation by contractor: - Duct from Separator E-12 to two (2) Cyclones E-16. - Two (2) Cyclones E-16. - Duct from cyclones to Fan E-18. - Fan E-18. - Duct from Fan E-18 to Kiln/Mill Baghouse E-19. - Mill bypass (recirculation) duct. - Kiln/Mill Baghouse E-19. - Dust Collector E-28. - Duct from Kiln I.D. Fan K-11 to roller mill except for refractory lined duct section. - Screw Conveyor E-27.
E-96	One (1) Set	Process Dampers and Gates
E-96-01	One (1)	Raw Mill Inlet Guillotine Gate Purpose : Isolation Height : 7 ft. - 9 in. Width : 6.0 ft.
E-96-05	One (1)	Raw Mill Discharge Guillotine Gate Purpose : Isolation Height : 8 ft. Width : 9 ft.

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EQUIPMENT LIST

Chapter E -- Raw Material Grinding

Equipment Number	Quantity	Description		
E-96-10	One (1)	Recirculation Damper		
		Purpose	:	Modulation
		Height	:	5 ft. - 6 in.
		Width	:	8 ft. - 6 in.
E-96-15	One (1)	Air Heater Outlet Guillotine Gate		
		Purpose	:	Isolation
E-96-20	One (1)	Fresh Air Flap		
		Diameter	:	4 ft.
E-97	One (1) Set	Chutes and Ducts for Chapter "E"		
E-98	One (1) Set	Dedusting Ducts for Chapter "E"		
E-99		OPEN NUMBER		

EQUIPMENT LIST

Chapter F -- Raw Meal Transport

Equipment Number	Quantity	Description
F-01	Two (2)	Air Gravity Conveyor

To transport produced raw meal from Cyclones E-16 to Air Gravity Conveyor F-02.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Raw Meal
Material Temperature	:	200°F
Capacity	:	96 and 192 stph
Width	:	14"
Length	:	31 ft. - 3 in.
Inclination	:	5°
Fan Motor Size	:	5 hp

Equipment Number	Quantity	Description
F-02	One (1)	Air Gravity Conveyor

To transport produced raw meal from Air Gravity Conveyors F-01 to Air Gravity Conveyor F-03.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Raw Meal
Material Temperature	:	200°F
Capacity	:	192 stph
Width	:	14"
Length	:	55 ft. - 9 in.
Inclination	:	5°
Fan Motor Size	:	7.5 hp

EQUIPMENT LIST

Chapter F -- Raw Meal Transport

Equipment Number	Quantity	Description
F-03	One (1)	Air Gravity Conveyor

To transport produced raw meal from a Air Gravity Conveyor F-02 to AEROPOL F-04.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Raw Meal
Material Temperature	:	200°F
Capacity	:	192 stph
Width	:	14"
Length	:	57 ft
Inclination	:	5°
Fan Motor Size	:	7.5 hp

Equipment Number	Quantity	Description
F-04	One (1)	AEROPOL Vertical Pneumatic Conveyor

To convey raw meal from Air Gravity Conveyor F-03 to the top of Blending Silo G-01.

Complete with conveying vessel, fluidizing floor, pickup pipe, nozzle, conveying air connections, pipe fittings, expansion box and pneumatic shut-off valve at the air inlet.

Vessel Diameter	:	63"
Vessel Height	:	236"
Material Conveyed	:	Raw Meal
Capacity	:	246 stph (Design)
Delivery Head Distance	:	230 ft
Air Requirement	:	7,063 cfm
Air Pressure	:	8.7 psi

EQUIPMENT LIST

Chapter F -- Raw Meal Transport

Equipment Number	Quantity	Description
F-05	Two (2)	AEROPOL Blowers

To provide conveying air for operation of AEROPOL F-04.

Complete with base plate, silencer and V-belt drive.

Air Delivery	:	3,532 scfm (each)
Air Pressure	:	7.3 psi
Motor Size	:	2 x 200 hp

Note: Aeration piping between blower and AEROPOL by Contractor.

F-06	One (1)	Expansion Box and Conveying Pipe

Conveying pipe will be by Contractor.

To vent the AEROPOL F-04 and allow separation of conveying air and material. Pipe and fittings to provide pneumatic conveying line from AEROPOL F-04 to the Expansion Box.

Expansion Box Size	:	79"/63"
Pipe Diameter	:	18"

F-07	One (1)	Air Gravity Conveyor

To transport produced raw meal from Expansion Box F-06 to Material Distributor F-08.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Raw Meal
Material Temperature	:	200°F
Capacity	:	192 stph
Width	:	14"
Length	:	20 ft.
Inclination	:	5°
Fan Motor Size	:	5 hp

EQUIPMENT LIST

Chapter F -- Raw Meal Transport

Equipment Number	Quantity	Description
F-08	One (1)	Material Distributor

To receive material from raw meal transport system and allow distribution of meal over entire Blending Silo G-01.

Complete with fabricated distributor vessel and four (4) AGC's, supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Raw Meal
Material Temperature	:	200°F
Capacity	:	192 stph
Distributor Diameter	:	63"
Fan Motor Size	:	5 hp

F-09 through F-96		OPEN NUMBERS
F-97	One (1) Set	Chutes for Chapter "F"
F-98 through F-99		OPEN NUMBERS

EQUIPMENT LIST

Chapter G -- Raw Meal Homogenization and Storage

Equipment Number	Quantity	Description
G-01	One (1)	Homogenizing Silo (By Contractor) To receive the raw meal for batch blending. Inside Diameter : 46' Inside Silo Total Height : 177 ft. Capacity : 8,000 st Contractor to include the following: - Access door in silo wall - Access hatch in silo roof - Over-under pressure valve
G-02	One (1)	Blending Silo Aeration System To provide aeration of the silo floor to facilitate material blending. Complete with aeration pads with porous media, air distribution system with headers for selective control of the air supply, main quadrant headers and four-way cycling valves for continuous flow of compressed air periodically directed to each individual quadrant in rotation.
G-03	One (1)	Blending Silo Central Chamber To receive the blended raw meal for discharge from the homogenization silo. The cone, support cylinder and fluidized relief section to be fabricated entirely out of steel.
G-04	One (1)	Aeration Blower To provide compressed air for operation of the Silo Aeration System G-02. Compressed Air Delivery : 344 cfm Compressed Air Pressure : 8.7 psi Blower Motor Size : 25 hp

EQUIPMENT LIST

Chapter G -- Raw Meal Homogenization and Storage

Equipment Number	Quantity	Description
G-05	One (1)	Discharge Blower

To provide compressed air for operation of the Central Chamber and Discharge Apparatus G-06.

Compressed Air Delivery : 268 cfm
Compressed Air Pressure : 8.7 psi
Blower Motor Size : 20 hp

Equipment Number	Quantity	Description
G-06	One (1)	Discharge Apparatus

To regulate the discharge of raw material from Homogenizing Silo G-01.

Complete with manual cut-off gate, pneumatic semi-rotary valve and flow control valve with electro mechanical actuator.

Discharge Capacity : 160 stph
Actuator : Auma

Equipment Number	Quantity	Description
G-07	One (1)	Dust Collector with Fan

To vent Homogenizing Silo G-01.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume : 15,000 acfm

Equipment Number	Quantity	Description
	One (1)	Collector Fan

To exhaust the dust collector.

Air Volume : 15,000 acfm
Air Temperature : 200°F
Static Pressure : -10" W.G.
Motor Size : 40 hp

EQUIPMENT LIST

Chapter G -- Raw Meal Homogenization and Storage

Equipment Number	Quantity	Description
	One (1)	Rotary Airlock
		To discharge dust from the dust collector.
		Motor Size : 1/2 hp
G-08 through G-94		OPEN NUMBERS
G-95	One (1) Lot	Insulation
		Supply and installation by contractor:
		- Dust Collector G-07.
G-96		OPEN NUMBER
G-97	One (1) Set	Chutes for Chapter "G"
G-98	One (1) Set	Dedusting Ducts for Chapter "G"
G-99		OPEN NUMBER

EQUIPMENT LIST

Chapter H -- Raw Meal Transport and Weighing

Equipment Number	Quantity	Description
H-01	One (1)	Air Gravity Conveyor

To transport blended raw meal from Homogenizing Silo G-01 to POLDOS H-05.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Raw Meal
Material Temperature	:	200°F
Capacity	:	160 stph
Width	:	12"
Length	:	61 ft
Inclination	:	5°
Fan Motor Size	:	7.5 hp

H-02 thru H-04		OPEN NUMBERS
H-05	One (1)	POLDOS-SR Kiln Dosing System

To regulate the feed rate of and convey the raw meal to the Preheater K-01. Control is accomplished as a function of the floor aeration pressure of the storage vessel.

Complete with storage and conveying vessel, fluidizing floor, pickup pipe, nozzle, conveying air connections, pipe fittings and pneumatic shut-off valve at the air inlet.

Conveying Vessel Diameter	:	49"
Storage Vessel Diameter	:	98"
Total Vessel Height	:	335"
Material Conveyed	:	Raw Meal
Capacity	:	209 stph (Design)
Delivery Head Distance	:	278 ft.
Air Requirement	:	6,173 cfm
Air Pressure	:	8.7 psi

EQUIPMENT LIST

Chapter H -- Raw Meal Transport and Weighing

Equipment Number	Quantity	Description
H-06	Two (2)	POLDOS Blowers

To provide conveying air for operation of POLDOS H-05.

Complete with base plate, silencer and V-belt drive.

Air Delivery	:	3143 cfm each
Air Pressure	:	8.7 psi
Motor Size (each)	:	2 x 200 hp

H-07	One (1)	Aeration Air Blower

To provide aeration air for POLDOS-SR.

Complete with base plate, silencer and V-belt drive.

Air Delivery	:	396 cfm
Air Pressure	:	8.7 psi
Motor Size	:	30 hp

Note: Aeration piping between blowers and POLDOS-SR by contractors.

H-08	One (1)	Dust Collector with Fan

For general de-dusting of raw meal transport system.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume	:	3000 acfm

	One (1)	Collector Fan

To exhaust the dust collector.

Air Volume	:	3000 acfm
Air Temperature	:	200°F
Static Pressure	:	-10" W.G.
Motor Size	:	10 hp

EQUIPMENT LIST

Chapter H -- Raw Meal Transport and Weighing

Equipment Number	Quantity	Description		
	One (1)	Rotary Airlock		
		To discharge dust from the dust collector.		
		Motor Size	:	1/2 hp
H-09	One (1) Lot	Raw Meal Transport Pipe (By Contractor)		
		Including one (1) manual operated splitter gate.		
		Pipe Diameter	:	18"
H-10 through H-94		OPEN NUMBERS		
H-95	One (1) Lot	Insulation		
		Supply and installation by contractor:		
		- Dust Collector H-08.		
H-96		OPEN NUMBER		
H-97	One (1) Set	Chutes for Chapter "H"		
H-98	One (1) Set	Dedusting Ducts for Chapter "H"		
H-99		OPEN NUMBER		

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EQUIPMENT LIST

Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description
K-01	One (1)	DOPOL 90 Preheater 15-15-14-16

This preheater is to operate in conjunction with a 13' - 1-1/2" dia. x 157'-6" long rotary kiln to produce 2300 stpd of cement clinker.

DOPOL 90 preheater complete with cyclones, precalciner, gas ducts, meal chutes, expansion joints, flap valves, inspection doors, air cannons, distribution plates in inlet housing, exhaust gas ducting from preheater.

For detailed description, see *Major Equipment Specifications.*

Number of Cyclone Stages	:	4
Nominal Dia. of Cyclone 1	:	21 ft. 9 in.
Nominal Dia. of Cyclone 2	:	21 ft. 9 in.
Nominal Dia. of Cyclone 3	:	20 ft. 8 in.
Nominal Dia. of Cyclones 4 (2 Dedusting Cyclones)	:	18 ft. 8 in.
Nominal Dia. of Precalciner	:	12 ft. 9 in.

K-02	One (1)	Burner System

Burner nozzles installed in the CC-chamber section of the Preheater for calcination of the raw meal prior to introduction for further pyroprocessing in the rotary kiln.

Type of Fuel	:	Coal
Number of Burners	:	2

K-03	One (1)	Rotary Kiln

Polysius 2-Station Rotary Kiln 13' - 1-1/2" dia. x 157 ft. - 6 in. long (4.0m x 48 m) driven by a 350 hp DC motor, 400-1200 rpm and fitted with loose tires. The kiln is to operate in conjunction with a Polysius DOPOL 90 Preheater to produce 2300 stpd of cement clinker when fed with a suitably proportioned raw material ground to a fineness of 20% R 200 mesh.

For detailed description, see *Major Equipment Specifications.*

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EQUIPMENT LIST

Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description
		Kiln complete with shell, kiln inlet with rubbing type seal, discharge seal, firing hood, two (2) riding rings (floating type) designed for a maximum Hertz pressure of 62,250 psi, hardness 160 BHN, and two (2) roller stations (hardness of rollers 175 BHN), bearings designed for a maximum pressure of 600 psi, one (1) manhole, welding electrodes for shell welding, girth gear, pillow blocks, girth gear lubrication, thrust rollers and nose ring cooling fans. Nose Ring Fans : 2 x 7.5 hp Kiln Thrust System Pump : 1 hp
K-04	One (1)	Kiln Drive To provide rotation of the kiln. Complete with drive pinion, main reducer, auxiliary reducer one-way clutch, backstop, couplings, coupling guards, base plates, DC main drive motor, and auxiliary drive motor. Kiln Speed : 3.0 rpm Motor Size : 350 hp DC Motor Speed : 400-1200 rpm Auxiliary Drive : 25 hp
K-05	One (1)	Kiln Main Burner To provide heat input to kiln. Includes burner pipe, nozzle, and expansion joint. Type of Fuel : Coal Pulverized Coal Capacity : 6.3 stph Primary Air Fan Motor : 25 hp
	One (1)	Overhead burner trolley with vertical and horizontal adjustment device. Forward and reverse motion to be motor driven.

EQUIPMENT LIST

Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description
K-06	One (1)	Clinker Grate Cooler (with Static Grate)

Type: REPOL RS-2418

To reduce the temperature of the cement clinker after it leaves the kiln. The jet-ring plate grate cooler cools the 2300 stpd of cement clinker from the kiln at approximately 2500°F. It cools the clinker to a temperature of 200°F when using ambient air at 90°F.

For detailed description, see *Major Equipment Specifications.* Includes housings, drives and motors, grate supports, grate plates, spillage drag chain, couplings, and guards.

Cooler Grate Hydraulic Pump	:	125 hp
Cooler Pump	:	30 hp
Filling Pump	:	1 hp
Static Grate	:	6 rows x 8 plates wide

Equipment Number	Quantity	Description
K-07	One (1) Set	Cooler Undergrate Fans

To provide cooling air for Clinker Cooler K-06.

All fans are complete with fabricated steel housings

Fan Capacities:

	Comp. #	Air Volume (acfm)	Static Pressure (in. W.G.)	Motor Size (hp)
	St. Gr.	16,950	40	200
	F2	16,600	40	200
	F3	7,400	40	100
	F4A	9,250	28	75
	F4B	9,250	28	75
Seal Air	F5	8,950	28	75
	F6	18,540	28	125
	F7A	6,890	20	40
	F7B	6,890	20	40
	F8	13,700	20	75
Seal Air	F9	7,100	20	40

EQUIPMENT LIST

Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description
K-08	One (1)	Clinker Breaker

To crush large pieces of clinker discharged from the Rotary Kiln, K-03.

Complete with wear protection, thermal insulation, air cooled rotor with Cr-Mo hammer shafts, special alloy hammers, V-belt drive, hydraulic coupling, and rail mounted housing.

Diameter	:	4 ft. 1 in.
Rotor Width	:	8 ft. 1 in.
Motor Size	:	75 hp
Number of Hammers	:	24
Weight of each Hammer	:	97 lbs.
Cooling Fan Motor	:	7.5 hp

K-09	One (1)	Tertiary Air Duct

To provide pre-heated combustion air to the Precalciner in K-01 and CC-Chamber K-02.

Complete with duct, support saddles, expansion joints and control dampers with actuators. Duct support structure at kiln piers by Polysius.

Diameter	:	68.5"
Length	:	187 ft.

	Three (3)	Tertiary Air Dampers (Butterfly)

Purpose	:	Modulation
Actuator	:	Harold Beck

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EQUIPMENT LIST

Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description
K-10	One (1)	Gas Conditioning Tower

For cooling of kiln exhaust gases prior to being discharged to atmosphere.

Includes tower, spray nozzles, water pumps, discharge screw conveyor, motors, and airlocks.

Operating Capacity	:	76 gpm H_2O
Design Capacity	:	100 gpm H_2O
Overall Height	:	62'
Diameter	:	15'

	One (1)	Rotary Screw Air Compressor

To provide compressed air for the gas conditioning tower.

Capacity	:	892 acfm
Pressure	:	125 psig
Motor Size	:	200 hp

K-11	One (1)	Kiln ID Fan

To exhaust the Preheater - Kiln system.

Complete with flanged inlet and outlet, wear strips on the wheel, ASTM A517 blades, AISI 4140 shaft, inspection doors, drain, sole plates for bearings, louvered inlet damper, coupling, coupling guard, vibration switches and temperature measurement for bearings.

Air Volume	:	217,300 acfm
Air Temperature	:	716°F Fan Design
Static Pressure	:	-26" W.G.
Fan Speed	:	880 rpm
Motor Size	:	1250 hp

K-12		OPEN NUMBER

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Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description
K-13	One (1)	Electrostatic Precipitator

To clean the gases of particulates discharged from the Clinker Cooler, K-06 sufficient for exhaust to the atmosphere. The unit generates a large electrostatically charged zone where the exhaust gases must pass prior to being emitted. This ionization zone creates a force by electrically charging the particles, causing them to be attracted to the oppositely charged collecting plates, thus cleaning the gases.

Complete with precipitator housing, collecting plates, cathode rods, rapper cleaning system, dust collecting screw, double tipping valves, and electrical controls.

Gas Volume Capacity	:	160,000 acfm
Screw Conveyor Motor	:	20 hp
Rotary Airlock Motor	:	2 hp
Penthouse Blower Motor	:	1.5 hp

Note: This clinker cooler exhaust system is under review.

Equipment Number	Quantity	Description
K-14	One (1)	Cooler Exhaust Fan

Complete with motorized inlet damper, flanged inlet and outlet, inspection doors, drain, sole plates for bearings, coupling and coupling guard, ASTM A517 blades, vibration switches and temperature measurement for bearings.

Air Volume	:	172,000 acfm
Air Temperature	:	550°F
Static Pressure	:	-9" W.G.
Fan Speed	:	1180 rpm
Motor Size	:	400 hp

EQUIPMENT LIST

Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description		
K-15	One (1)	Exhaust Stack (By Contractor)		
		To emit cooler exhaust gasses to atmosphere.		
		Steel stack with inspection door and instrumentation platform with access ladder.		
		Stack Diameter	:	9'-0" dia.
		Stack Height	:	196 ft. - 10 in.
K-16	One (1)	Screw Conveyor		
		To transport clinker dust collected from Electrostatic Precipitator K-13 to Deep Bucket Conveyor L-01.		
		Complete with conveyor troughs, screws with solid helicoid flights, drive and drive guard.		
		Capacity	:	10 stph
		Screw Diameter	:	12"
		Length	:	38 ft- 5 in.
		Motor Size	:	7.5 hp
K-17	One (1)	Screw Conveyor		
		To transport cooling tower dust to POLDOS-SR H-05.		
		Complete with conveyor troughs, screws with solid helicoid flights, drive and drive guard.		
		Capacity	:	10 stph
		Screw Diameter	:	14"
		Length	:	58 ft. - 5 in.
		Motor Size	:	10 hp
K-18 through K-19		OPEN NUMBERS		

EQUIPMENT LIST

Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description
K-20	One (1)	Cooling Fan

To provide kiln shell cooling in front of Roller Station II.

Complete with flanged inlet and outlet, ispection doors, drain, sole plate for bearings, V-belt and guard.

Air Volume	:	35,000 acfm
Air Temperature	:	70°F
Static Pressure	:	-9" W.G.
Fan Speed	:	1355 rpm
Motor Size	:	75 hp

Equipment Number	Quantity	Description
K-21	One (1)	Cooling Fan

To provide kiln shell cooling in front of kiln hood.

Complete with flanged inlet and outlet, inspection doors, drain, sole plate for bearings, V-belt and guard.

Air Volume	:	4,800 acfm
Air Temperature	:	70°F
Static Pressure	:	-9" W.G.
Fan Speed	:	2685 rpm
Motor Size	:	10 hp

Equipment Number	Quantity	Description
K-22 through K-93		OPEN NUMBERS
K-94	One (1) Lot	Refractory

Supply and installation by Owner's subcontractor.

- DOPOL 90 Preheater and Precalciner K-01.
- CC-Chamber K-02.
- Rotary Kiln K-03.
- Clinker Grate Cooler K-06.
- Tertiary Air Duct K-09.

EQUIPMENT LIST

Chapter K -- Preheater / Kiln System

Equipment Number	Quantity	Description		
K-95	One (1) Lot	Insulation		
		Supply and installation by contractor:		
		- Preheater downcomer duct. - Gas Conditioning Tower K-10. - Kiln I.D. Fan K-11. - Duct from Clinker Grate Cooler K-06 to ESP K-13. - ESP K-13. - Screw Conveyor K-17.		
K-96	One (1) Set	Process Dampers and Flaps		
		Consisting of:		
K-96-01	One (1)	Downcomer Duct Damper		
		Purpose	:	Isolation
		Height	:	7.2 ft.
		Width	:	7.2 ft.
K-96-05		Fresh Air Damper		
		Purpose	:	Protection
		Inside Diameter	:	2'-11"
K-97	One (1) Set	Chutes and Ducts for Chapter "K"		
K-98 through K-99		OPEN NUMBERS		

EQUIPMENT LIST

Chapter L -- Clinker Transport and Storage

Equipment Number	Quantity	Description
L-01	One (1)	Deep Bucket Conveyor with Scale

To transport the cement clinker from Clinker Cooler K-06 to Clinker Silos.

Complete with framework of welded steel construction, drive and take-up assembly with sprockets, antifriction bearings with sealed lubrication, double-strand flat link chain, cast hard-surfaced rollers and buckets. The transfer tower design and supply is by the contractor.

Material Conveyed	:	Cement Clinker
Capacity	:	153 stph (Design)
Conveying Speed	:	55 fpm
Vertical Lift	:	225 ft.
Shaft Center Distance	:	403 ft.
Bucket Size	:	10" W x 24" L
Motor Size	:	60 hp

L-02		OPEN NUMBER
L-03	One (1)	Dust Collector with Fan

For general de-dusting of clinker transport system.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume	:	3000 acfm

	One (1)	Collector Fan

To exhaust the dust collector.

Air Volume	:	3000 acfm
Air Temperature	:	300°F
Static Pressure	:	-10" W.G.
Motor Size	:	10 hp

EQUIPMENT LIST

Chapter L -- Clinker Transport and Storage

Equipment Number	Quantity	Description
	One (1)	Double Tipping Valve To discharge dust from the dust collector. Gravity operated.
L-04	One (1)	Diverter Gate To change silo destination of clinker. Size : 20 x 20 in. Motor Size : ¾ hp
L-05	One (1)	Pan Conveyor To transport clinker to Silo L-07 (south). Capacity : 153 stph (Design) Shaft Center Distance : 90 ft. Motor Size : 3 hp
L-06	One (1)	Dust Collector with Fan For general de-dusting of clinker storage system. Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment. Air Volume : 4000 acfm
	One (1)	Collector Fan To exhaust the dust collector. Air Volume : 4000 acfm Air Temperature : 300°F Static Pressure : -10" W.G. Motor Size : 20 hp
	One (1)	Double Tipping Valve To discharge dust from the dust collector. Gravity operated.

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EQUIPMENT LIST

Chapter L -- Clinker Transport and Storage

Equipment Number	Quantity	Description
L-07	Two (2)	Clinker Silos (By Contractor) Concrete silos for storage of produced clinker. Silo Capacity : 25,000 st each Silo Inside Diameter : 74 ft Silo Height : 185 ft
L-08 through L-94		OPEN NUMBERS
L-95	One (1) Lot	Insulation Supply and installation by contractor: - Dust Collectors L-03 and L-06.
L-96		OPEN NUMBER
L-97	One (1) Set	Chutes for Chapter "L"
L-98	One (1) Set	Dedusting Ducts for Chapter "L"
L-99		OPEN NUMBER

EQUIPMENT LIST

Chapter M -- Clinker Transport from Storage

Equipment Number	Quantity	Description
M-01	One (1)	Gate Feeder with Bar Gate

To discharge clinker from Clinker Silo #1 to the mill feed Belt Conveyor M-19.

Material Conveyed	:	Clinker
Capacity	:	96 stph (Operating) 153 stph (Design)
Size	:	24"
Motor Size	:	3/4 hp

	One (1)	Bar Gate

Heavy structural flanged steel frame with hardened bars equally spaced over the full length of the frame.

Length of Frame	:	24"
Width of Frame	:	24"

M-02	One (1)	Gate Feeder with Bar Gate

To discharge clinker from Clinker Silo #2 to the mill feed Belt Conveyor M-19.

Material Conveyed	:	Clinker
Capacity	:	96 stph (Operating) 150 stph (Design)
Size	:	24"
Motor Size	:	3/4 hp

	One (1)	Bar Gate

Heavy structural flanged steel frame with hardened bars equally spaced over the full length of the frame.

Length of Frame	:	24"
Width of Frame	:	24"

EQUIPMENT LIST

Chapter M -- Clinker Transport from Storage

Equipment Number	Quantity	Description
M-03	One (1)	Gate Feeder with Bar Gate

To discharge clinker from Clinker Silo #1 to the mill feed Belt Conveyor M-19.

Material Conveyed	:	Clinker
Capacity	:	96 stph (Operating) 153 stph (Design)
Size	:	24"
Motor Size	:	3/4 hp

One (1) Bar Gate

Heavy structural flanged steel frame with hardened bars equally spaced over the full length of the frame.

Length of Frame	:	24"
Width of Frame	:	24"

Equipment Number	Quantity	Description
M-04	One (1)	Gate Feeder with Bar Gate

To discharge clinker from Clinker Silo #1 to the mill feed Belt Conveyor M-19.

Material Conveyed	:	Clinker
Capacity	:	96 stph (Operating) 153 stph (Design)
Size	:	24"
Motor Size	:	3/4 hp

One (1) Bar Gate

Heavy structural flanged steel frame with hardened bars equally spaced over the full length of the frame.

Length of Frame	:	24"
Width of Frame	:	24"

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EQUIPMENT LIST

Chapter M -- Clinker Transport from Storage

Equipment Number	Quantity	Description
M-05	One (1)	Gate Feeder with Bar Gate

To discharge clinker from Clinker Silo #2 to the mill feed Belt Conveyor M-19.

Material Conveyed	:	Clinker
Capacity	:	76 stph (Operating) 153 stph (Design)
Size	:	24"
Motor Size	:	3/4 hp

One (1) Bar Gate

Heavy structural flanged steel frame with hardened bars equally spaced over the full length of the frame.

Length of Frame	:	24"
Width of Frame	:	24"

M-06	One (1)	Gate Feeder with Bar Gate

To discharge clinker from Clinker Silo #2 to the mill feed Belt Conveyor M-19.

Material Conveyed	:	Clinker
Capacity	:	96 stph (Operating) 153 stph (Design)
Size	:	24"
Motor Size	:	3/4 hp

One (1) Bar Gate

Heavy structural flanged steel frame with hardened bars equally spaced over the full length of the frame.

Length of Frame	:	24"
Width of Frame	:	24"

M-07 OPEN NUMBER

EQUIPMENT LIST

Chapter M -- Clinker Transport from Storage

Equipment Number	Quantity	Description
M-08	One (1)	Dust Collector with Fan

For general de-dusting of clinker transport system.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume : 4000 acfm

One (1) — Collector Fan

To exhaust the dust collector.

Air Volume	:	4000 acfm
Air Temperature	:	300°F
Static Pressure	:	-10" W.G.
Motor Size	:	20 hp

One (1) — Double Tipping Valve

To discharge dust from the dust collector. Gravity operated.

M-09 — OPEN NUMBER

M-10 — One (1) — Covered Gypsum and Limestone Storage (By Contractor)

To store gypsum and limestone for use in finish grinding.

Storage Building Dimension:

Length	:	100' - 0"
Width	:	80'-0"
Height (roof)	:	55 ft.

M-11 — One (1) — Reclaim Hopper - Gypsum (By Contractor)

To receive gypsum from front end loader.

Capacity	:	15 stons
Size	:	3' - 4" wide 17' - 0" long 6' - 0" high

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Chapter M -- Clinker Transport from Storage

Equipment Number	Quantity	Description
M-12	One (1)	Reclaim Hopper - Limestone (By Contractor)

To receive limestone from front end loader.

Storage Capacity : 15 stons
Size : 3' - 4" wide
: 17' - 0" long
: 6' - 0" high

M-13	One (1)	Rotary Arm Feeder for Gypsum

To regulate the feed rate of gypsum from Dump Hopper M-11 to Belt Conveyor M-15.

Material Conveyed : Gypsum
Capacity : 3-10 stph
Feeder Width : 22"
Feeder Length : 25 ft
Motor Size : 5 hp VFD

M-14	One (1)	Weighbelt Feeder

Regulates limestone withdrawal from Hopper M-12 to Belt Conveyor M-15.

Complete with supports, channel stringer frame, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required.

Capacity : 5-50 stph
Feeder Width : 36"
Feeder Length : 15 ft.
Motor Size : 3 hp VFD

EQUIPMENT LIST

Chapter M -- Clinker Transport from Storage

Equipment Number	Quantity	Description
M-15	One (1)	Belt Conveyor

To convey material from feeder M-13 and M-14 to Pan Conveyor M-19.

Complete with supports, truss-type frame, bents, walkways, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required. The transfer tower design and supply is by the contractor.

Material Conveyed	:	Gypsum or Limestone
Capacity	:	80 stph (Operating)
		106 stph (Design)
Width	:	30"
Horizontal Length	:	195 ft
Vertical Lift	:	12 ft.
Belt speed	:	60 fpm
Motor Size	:	10 hp

M-16		OPEN NUMBER
M-17	One (1)	Belt Scale
M-18	One (1)	Belt Scale
M-19	One (1)	Pan Conveyor

To convey clinker from clinker/gypsum/limestone delivery systems to Finish Mill N-01.

Complete with drive and take-up stations with chain sprockets, take-up threaded spindles with buffer springs, bolted support frames, drive coupling, shafts running in anti-friction bearings, double strand roller chain of rigid, anti-kink design with hardened bushings, rollers with anti-friction bearings, rails, overlapping steel troughs pivoting on each other and zero speed device.

EQUIPMENT LIST

Chapter M -- Clinker Transport from Storage

Equipment Number	Quantity	Description		
		The pan conveyor is covered (exposed section only) with a hinged/removable steel plate cover.		
		Material Conveyed	:	Clinker/Gypsum/Limestone
		Capacity	:	96 stph (Operating) 153 stph (Design)
		Conveying Speed	:	50 fpm
		Width of Steel Pans	:	24"
		Shaft Centers	:	260' - 8"
		Vertical Lift	:	39'-9"
		Motor Size	:	20 hp VFD
M-20	One (1)	Weigh Scale		
		To measure and control clinker feed to finish mill.		
		Capacity	:	180 stph (Design)
		Output Signal	:	4-20 mA
M-21		OPEN NUMBER		
M-22	One (1)	Diverter Gate		
		Manually operated.		
		Size	:	24" x 24"
M-23 thru M-96		OPEN NUMBERS		
M-97	One (1) Set	Chutes for Chapter "M"		
M-98	One (1) Set	Dedusting Ducts for Chapter "M"		
M-99		OPEN NUMBER		

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EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-01	One (1)	Polysius Two-Compartment Ball Mill

To grind cement clinker, gypsum, and limestone.

Shell supported mill complete with shell, girth gear, ridings, mill end walls with liners, division diaphragm between the two grinding compartments, discharge diaphragm at the mill outlet, stepped liners for the first grinding compartment, segregating liners for the second grinding compartment, hydrodynamic slide shoe bearings with lubrication systems, sole plates, feed spout, first ball charge +10% for reserve, fluid coupling and discharge housing with flap valve.

For detailed description, see *Major Equipment Specifications.*

Mill Type	:	Two Compartment
Shell Diameter x Length	:	15'-9" x 46'-0"
Length of Grinding compartments	:	first - 13 ft. 4 in.
	:	second - 30 ft. 5 in.
Production Capacity	:	136 stph @ 3800 Blaine with Grinding Aid
Shaft Power Requirements	:	
Mill Speed	:	15.5 rpm
Filling Degree	:	32.25%

One (1) Combiflex Mill Drive

Complete with 2 self-aligning pinions, pinion shaft bearings, floating shaft with bearings, main input shaft, sole plates, coupling, coupling guard, and lubrication system.

Motor Size : 6500 hp

One (1) Auxilliary Drive

Complete with reducer, lock-out, motor and couplings.

Motor Size : 60 hp

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
	One (1) Lot	Grinding Media for Finish Mill
		Tons of Media : 352 stons + 10% Reserve
N-02		OPEN NUMBER
N-03	One (1)	Air Gravity Conveyor

To transport material from mill discharge to Bucket Elevator N-04.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Finish Mill Discharge
Material Temperature	:	234°F
Capacity	:	510 stph
Width	:	20"
Length	:	17 ft.
Inclination	:	12°
Fan Motor Size	:	4 hp

N-04	One (1)	Bucket Elevator

To lift the mill ground material from the mill for discharge via air gravity conveyor to the dynamic separator.

Complete with casing, head assembly, boot assembly, segmental rim traction wheel, internal gravity take-up, conveying chain, buckets, drive, backstop, guards and inching drive.

Material Conveyed	:	Finish Mill Discharge
Capacity	:	510 stph (Operating) 675 stph (Design)
Center Distance	:	102 ft.
Motor Size (Main)	:	100 hp
Motor Size (Inching)	:	10 hp

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-05	One (1)	Air Gravity Conveyor

To transport material from Bucket Elevator N-04 to SEPOL N-06.

Complete with fabricated conveyor troughs supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fans for AGC and ball trap.

Material Conveyed	:	Finish Mill Discharge
Material Temperature	:	200°F
Capacity	:	510 stph
Width	:	20"
Length	:	86 ft.
Inclination	:	12°
Fan Motor Size	:	10 hp

	One (1)	Ball Trap

To collect tramp iron discharged from the ball mill. Located in AGC N-05.

Fabricated pyramidal steel hopper, complete with bottom flange, horizontal manually operated slide gates and inspection door.

N-06	One (1)	SEPOL High Efficiency Separator - Single Pass

To separate the material discharged from the ball mill into finished product and an oversize fraction for gravity return to ball mill.

Centrifugal air separator with steel housing, distributing plate, cage type rotor, rotor shaft, wear liners, lubrication system for lower bearings, reducer, coupling, coupling guard, guide vanes, grit cone, tipping valve.

For detailed description, see *Major Equipment Specifications*.

Type	:	270/0-S
Material	:	Cement
Rotor Diameter	:	8'-10"
Rotor Motor	:	350 hp (Variable Speed)

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-07	One (1)	Air Gravity Conveyor

To transport oversized product from SEPOL N-06 to Impact Flow Meter N-08.

Complete with fabricated conveyor trough supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Cement Grits
Material Temperature	:	158°F
Capacity	:	320 stph
Width	:	14"
Length	:	10 ft.
Inclination	:	12°
Fan Motor Size	:	5 hp

N-08	One (1)	Impact Flow Meter

To provide a measurement of the grits being returned to the finish mill.

Complete with control cabinet with feed rate indicator and a circulating flow controller.

Material Measured	:	Cement Grits
Grain Size	:	Minus 1/8"
Bulk Density	:	62 lbs./ft^3
Capacity	:	75-500 stph
Output Signal	:	4-20 mA

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-09	One (1)	SEPOL Dust Collector

To collect material from the vent of SEPOL High Efficiency Separator N-06.

Complete with fabricated steel housing, fabric bags, bag support, bag cleaning system, flanged discharge hoppers, air gravity conveyors, inspection doors and supports.

Air Volume	:	128,600 acfm
Temperature	:	175°F
Cloth Area	:	28,423 ft^2
Air to Cloth Ratio	:	4.5:1
AGC Fan Motor Size	:	15 hp

N-10	One (1)	Dust Collector Fan

To vent the separator Dust Collector N-09.

Complete with flanged inlet and outlet, inspection doors, drain, sole plates, bearings, vibration switch, coupling and coupling guard.

Air Volume	:	128,600 acfm
Air Temperature	:	175°F
Static Pressure	:	-21" W.G.
Motor Size	:	600 hp

	One (1)	Damper

To regulate and control the air volume of the SEPOL High Efficiency Dust Collector.

Complete with louver and actuator and the necessary controls for automatic operation.

N-11		OPEN NUMBER

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-12	One (1)	Mill Vent Dust Collector

To collect the material from the mill vent airstream.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning system, discharge hopper, air gravity conveyor, inspection door and supports.

Type	:	Pulse Jet
Air Volume	:	35,000 acfm
Temperature	:	230°F
Cloth Area	:	7,959 ft^2
Air to Cloth Ratio	:	4.5:1
AGC Fan Motor Size	:	5 hp

Equipment Number	Quantity	Description
N-13	One (1)	Dust Collector Fan

To vent the mill vent dust collector.

Complete with flanged inlet and outlet, inspection doors, drain, sole plates, bearings, vibration switch, coupling and coupling guard.

Air Volume	:	35,000 acfm
Air Temperature	:	230°F
Static Pressure	:	-15" W.G.
Motor Size	:	150 hp

Equipment Number	Quantity	Description
	One (1)	Damper

To regulate and control the air volume of the mill vent dust collector. Complete with louver and actuator and the necessary controls for automatic operation.

Equipment Number	Quantity	Description
N-14		OPEN NUMBER

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-15	One (1)	Mill Water Spray System for Compartment #1

System consists of injection lance for air and water, water pumping equipment, one air blower with motor and filter, flow meter, regulating valve, and solenoid valve for instantaneous shutoff of the water supply in the event of mill shutdown.

Water to be Injected	:	12 gpm max.
Water Pressure	:	145 psi
Pump Capacity	:	13.2 gpm
Pump Motor Size	:	5 hp
Blower Capacity	:	610 cfm
Blower Motor Size	:	3 hp

N-16	One (1)	Mill Water Spray System for Compartment #2

System consists of injection lance for air and water, water pumping equipment, one air blower with motor and filter, flow meter, regulating valve, and solenoid valve for instantaneous shutoff of the water supply in the event of mill shutdown.

Water to be Injected	:	12 gpm max.
Water Pressure	:	145 psi
Pump Capacity	:	13.2 gpm
Pump Motor Size	:	5 hp
Blower Capacity	:	610 cfm
Blower Motor Size	:	3 hp

N-17	One (1)	Mill Grinding Aid Spray System

Complete with one (1) main storage tank, one (1) metering pump with motor, solenoid valves, pressure regulator, spray lance and flow meter and purge air blower. Interconnecting piping by others.

Size of Storage Tank	:	7000 gal.
Pump Motor Size Transfer	:	1 hp
Pump Capacity	:	4 gpm
Motor System Metering	:	1 hp (Variable Speed)

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-18	One (1)	Air Gravity Conveyor

To collect cement from SEPOL Dust Collector N-09 and deliver to Pneumatic Screw Pump via AGC N-19.

Complete with fabricated conveyor troughs supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Material Conveyed	:	Cement
Material Temperature	:	160°F
Capacity	:	136 stph
Width	:	12"
Length	:	38 ft.
Inclination	:	5°
Fan Motor Size	:	5 hp

N-19		OPEN NUMBER
N-20	Two (2)	Rotary Valves

Size	:	24" x 24"
Motor Size	:	3 hp

N-21		OPEN NUMBER
N-22	One (1)	Rotary Valve

Size	:	16" x 16"
Motor Size	:	1/2 hp

N-23 through N-86		OPEN NUMBERS
N-87	One (1)	Lifting Beam for Ball Mill Drive - By Contractor
N-88	One (1)	Lifting Beam for SEPOL - By Contractor

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-89	One (1)	Lifting Beam for Bucket Elevator - By Contractor
N-90	Two (2)	Mill Sound Level Detectors

To acoustically measure the filling level.

Consisting of:

ASC-2 Audio Signal Converter, two (2) Channel Output, Sonic Sensor Card, Module Rock, Voltage Regulator, Signal Monitor Card, Meter Card and Microphone Assembly.

Equipment Number	Quantity	Description
N-91	One (1)	Dust Collector with Fan

For general de-dusting of clinker grinding system.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume	:	6000 acfm

One (1) Collector Fan

To exhaust the dust collector.

Air Volume	:	6000 acfm
Air Temperature	:	200°F
Static Pressure	:	-10" W.G.
Motor Size	:	20 hp

One (1) Rotary Valve

To discharge from the dust collector.

Motor Size	:	½ hp

N-92 OPEN NUMBER

EQUIPMENT LIST

Chapter N -- Cement Grinding

Equipment Number	Quantity	Description
N-93	One (1)	Large Stack (By Contractor) To emit SEPOL exhaust gases to atmosphere. Stack Diameter : 7' - 6" Stack Height : 66' - 0"
N-94	One (1)	Small Stack (By Contractor) To emit mill exhaust gases to atmosphere. Stack Diameter : 4' - 0" Stack Height : 66' - 0"
N-95	One (1) Lot	Insulation Supply and installation by contractor: - Dust Collectors N-09 and N-12.
N-96		OPEN NUMBER
N-97	One (1) Set	Chutes and Ducts for Chapter "N"
N-98	One (1) Set	Dedusting Ducts for Chapter "N"
N-99		OPEN NUMBER

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EQUIPMENT LIST

Chapter P -- Cement Transport

Equipment Number	Quantity	Description
P-01	One (1)	Pneumatic Screw Pump

To convey the finish cement to cement silos.

Conveying Rate	:	150 stph
Motor Size	:	200 hp

P-02	Two (2)	Compressors (Both Operating)

To provide compressed air for operation of Pneumatic Screw Pump P-01.

Capacity	:	2270 scfm (each)
Air Pressure	:	30 psig
Motor Size	:	300 hp (each)

Note: Piping between compressor and screw pump by contractor.

P-03	One (1) Lot	Material Conveying Line (By Contractor)

Pipe and fittings to provide pneumatic conveying line from Screw Pump P-01 to the respective cement storage silos.

Pipe Diameter	:	12"
Max. Conveying Distance	:	920 ft.
Horizontal	:	710 ft.
Vertical	:	210 ft.

	Four (4)	Two-Way Diverter Valves

To provide selection for cement silo filling. Complete with motorized operator for one (1) valve. Three (3) valves are manually operated.

Motor Size	:	1 hp

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EQUIPMENT LIST

Chapter P -- Cement Transport

Equipment Number	Quantity	Description
P-04 through P-99		OPEN NUMBERS

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EQUIPMENT LIST

Chapter Q -- Cement Storage and Bulk Loading

Equipment Number	Quantity	Description
Q-01	Four (4)	Cement Storage Silos with Steel Cones (By Contractor)

Concrete silos for enclosed storage of finish cement. Two silos for Type I, one silo for Type II, and one silo for Masonry Cements.

Silo Inside Diameter	:	46'
Silo Height	:	186 ft.
Silo Capacity Each	:	7,000 st

Contractor to include the following:

- Access door in the silo wall.
- Access hatch in the silo roof.
- Over-under pressure valve.

Q-02	Four (4)	Aeration Systems

To provide aeration of Silos Q-01.

Complete with flat aerated bottom and porous media.

Q-03	Nine (9)	Discharge Apparatus

To regulate the discharge of cement from Silos Q-01.

Capacity (7 Units)	:	500 stph
Capacity (2 Units)	:	67 stph

Q-04	Four (4)	Aeration Blowers

To provide air for Systems Q-02 and Discharge Apparatus Q-03.

Blower Capacity	:	186 cfm each
Blower Pressure	:	8.7 psi
Motor Size	:	15 hp each

EQUIPMENT LIST

Chapter Q -- Cement Storage and Bulk Loading

Equipment Number	Quantity	Description
Q-05		OPEN NUMBER
Q-06	One (1)	Interstice Cement Storage Silo with Steel Cone (By Contractor)
Q-07	One (1)	Interstice Aeration Systems
Q-08	One (1)	Aeration Blower

Q-06 — Interstice Cement Storage Silo with Steel Cone (By Contractor)

Concrete silo for enclosed storage of Type I or fringe finish cement.

Silo Height : 186'
Silo Capacity : 2,500 st

Contractor to include the following:

- Access hatch in the silo roof.
- Over-under pressure valve.

Q-07 — Interstice Aeration Systems

To provide aeration of Interstice Silo Q-06.

Complete with flat aerated bottom and porous media.

Q-08 — Aeration Blower

To provide air for System Q-07.

Blower Capacity : 15.7 cfm
Blower Pressure : 8.7 psi
Motor Size : 10 hp

EQUIPMENT LIST

Chapter Q -- Cement Storage and Bulk Loading

Equipment Number	Quantity	Description
Q-09		OPEN NUMBER
Q-10	One (1)	Air Gravity Conveyor

To transport cement from Discharge Apparatus Q-03 for interstice silo Type I or fringe Cement to Loading Spout Q-16.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, and supporting brackets, and high pressure fluidizing fan.

Capacity	:	500 stph
Width	:	16"
Length	:	26 ft.
Inclination	:	8°
Fan Motor Size	:	5 hp

Q-11	One (1)	Air Gravity Conveyor

To transport cement from Discharge Apparatus Q-03 for Type I Cement to Loading Spout Q-16.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets, and high pressure fluidizing fan.

Capacity	:	500 stph
Width	:	16"
Length	:	14 ft.
Inclination	:	8°
Fan Motor Size	:	5 hp

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EQUIPMENT LIST

Chapter Q -- Cement Storage and Bulk Loading

Equipment Number	Quantity	Description
Q-12	One (1)	Air Gravity Conveyor

To transport cement from Discharge Apparatus Q-03 for Type I or Masonry Cement to Loading Spout Q-13.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors supporting brackets, and high pressure fluidizing fan.

Capacity	:	500 stph
Width	:	16"
Length	:	30 ft.
Inclination	:	8°
Fan Motor Size	:	5 hp

Equipment Number	Quantity	Description
Q-13	One (1)	Truck Loading Spout

To permit discharge of cement to the truck below.

Consisting of telescopic loading spout, hypalon/nylon sleeve, level sensing probe and slack cable limit switch.

Capacity	:	500 stph
Spout Motor Size	:	1-1/2 hp

Equipment Number	Quantity	Description
Q-14	One (1)	Dust Collector with Fan

For general de-dusting of cement loading system.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume	:	3000 acfm

EQUIPMENT LIST

Chapter Q -- Cement Storage and Bulk Loading

Equipment Number	Quantity	Description
	One (1)	Collector Fan

To exhaust the dust collector.

Air Volume	:	3000 acfm
Air Temperature	:	150°F
Static Pressure	:	-8" W.G.
Motor Size	:	10 hp

Q-15	One (1)	Truck Scale (By Polysius)

Scale with load cells and concrete deck.

Capacity	:	100 st
Size	:	70' x 11'

Q-16	One (1)	Truck Loading Spout

To permit discharge of cement to the truck below.

Consisting of telescopic loading spout, hypalon/nylon sleeve, level sensing probe and slack cable limit switch.

Capacity	:	500 stph
Spout Motor Size	:	1-1/2 hp

Q-17	One (1)	Dust Collector with Fan

For general de-dusting of cement loading system.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume	:	3000 acfm

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EQUIPMENT LIST

Chapter Q -- Cement Storage and Bulk Loading

Equipment Number	Quantity	Description
	One (1)	Collector Fan To exhaust the dust collector. Air Volume : 3000 acfm Air Temperature : 150°F Static Pressure : 8" W.G. Motor Size : 10 hp
Q-18	One (1)	Truck Scale (By Polysius) Scale with load cells and concrete deck. Capacity : 100 T Size : 70' x 11'
Q-19 Thru Q-24		OPEN NUMBERS
Q-25	One (1)	Dust Collector with Fan For general de-dusting of the masonry cement silo. Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment. Air Volume : 12,000 acfm
	One (1)	Collector Fan To exhaust the dust collector. Air Volume : 12,000 acfm Air Temperature : 150°F Static Pressure : -10" W.G. Motor Size : 40 hp

EQUIPMENT LIST

Chapter Q -- Cement Storage and Bulk Loading

Equipment Number	Quantity	Description		
	One (1)	Rotary Airlock		
		To discharge dust from the dust collector.		
		Motor Size	:	1 hp
Q-26	One (1)	Dust Collector with Fan		
		For general de-dusting of cement silos.		
		Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.		
		Air Volume	:	12,000 acfm
	One (1)	Collector Fan		
		To exhaust the dust collector.		
		Air Volume	:	12,000 acfm
		Air Temperature	:	150°F
		Static Pressure	:	-10" W.G.
		Motor Size	:	40 hp
	One (1)	Rotary Airlock		
		To discharge dust from the dust collector.		
		Motor Size	:	1 hp
Q-27		OPEN NUMBER		
Q-28	One (1)	Collection Hopper for Cement		
		Located above Loading Spout Q-13.		
		Size	:	2'-6" Diameter 9'-9" High

EQUIPMENT LIST

Chapter Q -- Cement Storage and Bulk Loading

Equipment Number	Quantity	Description
Q-29	One (1)	Collection Hopper for Cement Located above Loading Spout Q-16. Size : 2'-6" Diameter 9'-9" High
Q-30 thru Q-96		OPEN NUMBERS
Q-97	One (1) Set	Chutes for Chapter "Q"
Q-98	One (1) Set	Dedusting Ducts for Chapter "Q"
Q-99		OPEN NUMBER

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EQUIPMENT LIST

Chapter R -- Packing and Loading Systems

Equipment Number	Quantity	Description
R-01	One (1)	Air Gravity Conveyor

To transport cement from Discharge Apparatus Q-03 for Type I Cement to Bucket Elevator R-03.

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets and high pressure fluidizing fan.

Capacity	:	67 stph
Width	:	8"
Length	:	40 ft.
Inclination	:	8°
Fan Motor Size	:	5 hp

Equipment Number	Quantity	Description
R-02	One (1)	Air Gravity Conveyor

To transport cement from Discharge Apparatus Q-03 for Masonry Cement to Bucket Elevator R-03

Complete with fabricated conveyor trough, supplied in flanged sections, porous media, inspection doors, supporting brackets, and high pressure fluidizing fan.

Capacity	:	67 stph
Width	:	8"
Length	:	40 ft.
Inclination	:	8°
Fan Motor Size	:	5 hp

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EQUIPMENT LIST

Chapter R -- Packing and Loading Systems

Equipment Number	Quantity	Description		
R-03	One (1)	Bucket Elevator		
		To lift the cement to be packaged from grade level to Vibrating Screen R-04.		
		Complete with casing, head assembly, boot assembly, drive pulley, internal gravity take-up, fabric belt, buckets, drive, backstop guards and inching drive.		
		Capacity	:	67 stph (Operating) 90 stph (Design)
		Center Distance	:	52 ft.
		Motor Size	:	10 hp
R-04	One (1)	Vibrating Screen		
		To remove oversized lumps of material to prevent entry into the Packing Machine R-06.		
		Wire mesh screen, frame, complete with tension device, mechanical vibrating group, discharge hopper, and oversize rejects chute.		
		Capacity	:	67 stph (Design)
		Size	:	51" x 87" x 79"
		Motor Size	:	3 hp
R-05	One (1)	Storage Bin		
		Surge capacity for Packing Machine R-06.		
		Capacity	:	10 st
	One (1)	Bin Gate		
		To discharge from the surge hopper. Hand operated.		
		Size	:	18" x 26"

EQUIPMENT LIST

Chapter R -- Packing and Loading Systems

Equipment Number	Quantity	Description
	Two (2)	Rotary Valve Feeders

For product feed from storage bin to the packing machine.

Capacity	:	67 stph (Design)
Size	:	18" x 26"
Motor Size	:	3 hp

Equipment Number	Quantity	Description
R-06	One (1)	Bag Packing Machine (4 Spout - In-line)

To package finished cement in bags for shipment.

Manual bag placement includes 4 spouts for valved bags, automatic bag drop when filled, electronic load cells for accuracy, wire net belt conveyor to move bags from packing machine, empty bag tables, control panel, dust collection hopper, and bag cleaning system.

Capacity	:	1200 bags/hr. of 94 lbs.
	:	1400 bags/hr. of 47 lbs.
Installed Power	:	30 hp

Equipment Number	Quantity	Description
R-07	One (1)	Screw Conveyor

To receive spilled cement from Packing Maching R-06 and transfer to Bucket Elevator R-03.

Complete with conveyor troughs, screws with solid helicoid flights, drive and drive guard.

Capacity	:	10 stph
Screw Diameter	:	12"
Length	:	17 ft.
Motor Size	:	3 hp

Equipment Number	Quantity	Description
R-08		OPEN NUMBER

EQUIPMENT LIST

Chapter R -- Packing and Loading Systems

Equipment Number	Quantity	Description
R-09	One (1) Lot	Bag Conveyors

To receive bags from wire net belt conveyor under Packing Machine R-06 and transport to Palletizer R-10.

Consisting of:

- One (1) Gravity Roller Way
- One (1) Upper Rubber Belt
- One (1) Lower Rubber Belt

Equipment Number	Quantity	Description
R-10	One (1)	Palletizer

To automatically stack bags of cement onto pallet for transportation by truck or warehouse storage.

Consisting of:

- One (1) Steel Support Frame
- One (1) Special Belt
- One (1) Turning Device
- Two (2) Roller Ways
- One (1) Mobile Plane Station
- One (1) Lot Electric Devices
- One (1) Driven Roller Way
- One (1) Automatic Unit
- One (1) Driven and Rotating Roller Way
- One (1) Gravity Roller Way

Capacity	:	1200-1400 Bags/hr.
Installed Power	:	10 hp

R-11 OPEN NUMBER

EQUIPMENT LIST

Chapter R -- Packing and Loading Systems

Equipment Number	Quantity	Description
R-12	One (1)	Dust Collector with Fan

For general de-dusting of cement packing system.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume : 12,000 acfm

One (1) — Collector Fan

To exhaust the dust collector.

Air Volume : 12,000 acfm
Air Temperature : 150°F
Static Pressure : -10" W.G.
Motor Size : 40 hp

One (1) — Rotary Valve

To discharge dust from the dust collector.

Motor Size : 1 hp

R-13 — One (1) — Screw Conveyor

To transport dust from R-12 to Screw Conveyor R-07.

Complete with conveyor troughs, screws with solid helicoid flights, drive and drive guard.

Capacity : 2 stph
Screw Diameter : 14"
Length : 15 ft.
Motor Size : 1.5 hp

R-14 thru R-96 — OPEN NUMBERS

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Chapter R -- Packing and Loading Systems

Equipment Number	Quantity	Description
R-97	One (1) Set	Chutes for Chapter "R"
R-98	One (1) Set	Dedusting Ducts for Chapter "R"
R-99		OPEN NUMBER

EQUIPMENT LIST

Chapter S -- Coal Transport and Grinding

Equipment Number	Quantity	Description
S-01	One (1)	Coal Unloading Hopper (By Contractor)

To receive coal or coke from dump trucks or front end loader. Including 6" grizzly and bar gate at hopper discharge.

Material	:	Coal
Material Size	:	2" max.
Moisture	:	10% max.
Capacity	:	65 st
Size	:	12'-0" Wide 50'-0" Long 11'-0" High

Equipment Number	Quantity	Description
S-02	One (1)	Belt Conveyor

To receive raw coal or coke and transport to Belt Conveyor S-03.

Complete with supports, channel stringer frame, impact idlers, troughing idlers, return idlers, drive and tensioning pulleys, rubber belt, belt scraper, drive with guard and covers as required.

Capacity	:	200 stph (Operating) 266 stph (Design)
Width	:	42"
Horizontal Length	:	53 ft.
Vertical Lift	:	2 ft.
Belt Speed	:	100 fpm
Motor Size	:	30 hp

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EQUIPMENT LIST

Chapter S – Coal Transport and Grinding

Equipment Number	Quantity	Description
		To receive coal dust from the Mill Dust Collectors S-17 and transfer to the S-20 pulverized coal storage bin.
		Complete with conveyor troughs, screws with solid helicoid flights, drive and drive guard.
		Capacity : 14 stph (Operating)
		Inlets : 2
		Motor Size : 3 hp

EQUIPMENT LIST

Chapter S -- Coal Transport and Grinding

Equipment Number	Quantity	Description
S-17	Two (2)	Cylindrical Type Coal Mill Dust Collectors

To dedust the exhaust gases from the Coal Mill, S-15.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment, discharge hopper, supports and sufficient rupture diaphragms (explosion vents) to comply with NFPA Code 69.

Air Volume	:	24,000 acfm
Air to Cloth Ratio	:	4:1

Two (2) — Rotary Valves

To discharge dust from the dust collectors.

Size	:	14" x 14"
Motor Size	:	1 hp (each)

Four (4) — Isolation Valves

Mounted on the inlet and outlet of the dust collector. Complete with pneumatic actuators and limit switches (open/closed).

Diameter	:	24"

EQUIPMENT LIST

Chapter S -- Coal Transport and Grinding

Equipment Number	Quantity	Description
S-18	One (1)	Coal Mill ID Fan

To induce air flow through the roller mill and dynamic separator for the purpose of drying the raw coal and transporting the pulverized coal to the Coal Mill Dust Collector S-17.

Complete with flanged inlet and outlet, inspection doors, drain, sole plates for bearings, coupling, coupling guard and motor-operated damper.

Gas Flow	:	24,000 acfm
Temperature	:	150°F
Fan Speed	:	1200 rpm
Motor Size	:	200 hp

Equipment Number	Quantity	Description
S-19		OPEN NUMBER
S-20	One (1)	Pulverized Coal Storage Bin

To provide pulverized coal storage and surge ahead of the kiln/calciner firing system. Includes explosion vent and agitator.

Bin mounted on load cells.

Capacity	:	5 st

Agitator System consisting of:

- One (1) Agitator with 7.5 hp drive
- Two (2) Discharge Pipes
- Two (2) Pneumatically Operated Gates
- Two (2) Axial Kompensators
- One (1) Aeration System with nozzles and pipes - for agitator
- Two (2) Aeration Systems with nozzles and pipes for

EQUIPMENT LIST

Chapter S -- Coal Transport and Grinding

Equipment Number	Quantity	Description
S-21	One (1)	Dust Collector with Fan

For general de-dusting of pulverized coal transfer system.

Complete with fabricated steel housing, fabric bags, bag supports, bag cleaning equipment.

Air Volume : 2000 acfm

One (1) — Collector Fan

To exhaust the dust collector.

Air Volume	:	2000 acfm
Air Temperature	:	150°F
Static Pressure	:	-10" W.G.
Motor Size	:	10 hp

One (1) — Rotary Valve

To discharge dust from the dust collector.

Size of Motor : 1 hp

S-22 Thru S-25 — OPEN NUMBERS

S-26 — One (1) — Rotor Weighfeeder (Pfister)

For dosing of fuel to main kiln burner.

Consisting of load measuring device, shut-off gate (41-GAT-16), compensator and downpipe. Pipework by others.

Material	:	Pulverized Coal/Coke
Temperature	:	Amb. 176°F
Feed Rate Max.	:	10 stph
Feed Rate Min.	:	.90 stph
Motor	:	7.5 hp/1800 rpm
Drive Type	:	Variable Frequency Drive

EQUIPMENT LIST

Chapter S -- Coal Transport and Grinding

Equipment Number	Quantity	Description
S-27	One (1)	Conveying Blower

To provide conveying air for operation of Rotor Weighfeeder S-26.

The rotary lobe blower will be mounted on a base frame, steel skid and oil drip pan complete with inlet and discharge silencer, acoustic hood, vibration isolating mounts, V-belt drive, pressure relief valve and flexible connector.

Capacity	:	1270 scfm
Air Pressure	:	8.7 psig
Motor Size	:	75 hp
Motor Speed	:	1800 rpm

Note: Piping between Blower and Rotor Weighfeeder by Contractor.

S-28	One (1) Lot	Material Conveying Line (By Contractor)

Pipe and fittings to provide pneumatic conveying to the Main Kiln Burner K-05.

Pipe Diameter	:	8"
Max. Conveying Distance	:	160 ft.

S-29	One (1)	Slide Gate

For isolation between the Rotor Weighfeeder S-26 and Main Kiln Burner K-05.

Size	:	8 in
Actuation	:	Pneumatic
Solenoid	:	5/2-Way

S-30 through S-35		OPEN NUMBERS

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EQUIPMENT LIST

Chapter S -- Coal Transport and Grinding

Equipment Number	Quantity	Description
S-36	One (1)	Rotor Weighfeeder (Pfister)

For dosing of fuel to CC-Chamber.

Consisting of load measuring device, shut-off gate (41-GAT-16), compensator and downpipe. Pipework by others.

Material	:	Pulverized Coal/Coke
Temperature	:	Amb. 176°F
Feed Rate Max.	:	10 stph
Feed Rate Min.	:	.90 stph
Motor	:	7.5 hp/1800 rpm
Drive Type	:	Variable Frequency Drive

S-37	One (1)	Conveying Blower

To provide conveying air for operation of Rotor Weighfeeder S-36.

The rotary lobe blower will be mounted on a base frame, steel skid and oil drip pan complete with inlet and discharge silencer, acoustic hood, vibration isolating mounts, V-belt drive, pressure relief valve and flexible connector.

Capacity	:	1270 scfm
Air Pressure	:	8.7 psig
Motor Size	:	75 hp
Motor Speed	:	1800 rpm

Note: Piping between Blower and Rotor Weighfeeder by Contractor.

S-38	One (1) Lot	Material Conveying Line (By Contractor)

Pipe and fittings to provide pneumatic conveying to the CC-Chamber Burner K-02.

Pipe Diameter	:	8"
Max. Conveying Distance	:	440 ft.

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Chapter T -- Plant Services

Equipment Number	Quantity	Description
T-01	One (1) Lot	Refractory Materials for Preheater K-01 (Supplied and Installed by owner's subcontractor according to Polysius Drawings)
T-02	One (1) Lot	Refractory Materials for Rotary Kiln K-03 (Supplied and Installed by owner's subcontractor according to Polysius Drawings)
T-03	One (1) Lot	Refractory Materials for Tertiary Air Duct K-09 (Supplied and Installed by owner's subcontractor according to Polysius Drawings)
T-04	One (1) Lot	Refractory Materials for Clinker Cooler (Supplied and Installed by owner's subcontractor according to Polysius Drawings)
T-05	One (1) Lot	Refractory Materials and Insulation for Miscellaneous Ductwork (Supplied and Installed by owner's subcontractor according to Polysius Drawings)
T-06	Seven (7)	Air Receivers
T-07	Three (3)	Plant Compressed Air Systems

To provide compressed air for plant operation.

Capacity	:	892 acfm (each)
Pressure	:	125 psig
Motor Size	:	3 x 200 hp

Equipment Number	Quantity	Description
T-08	One (1)	Passenger Elevator (By Polysius)

To service the preheater and homogenizing silos.

Complete with all necessary controls required by State Law.

Type	:	Rack and Pinion
Elevator Capacity	:	4,400 lbs.
Car Size	:	10' x 4.3' x 8.4'
Door Opening	:	4' x 6.7'
Elevator Speed	:	130 fpm
Total Travel	:	230 ft.
No. of Landings	:	8
Motor Size	:	2 x 9.5 kW (15 hp)

EQUIPMENT LIST

Chapter T -- Plant Services

Equipment Number	Quantity	Description
T-09	One (1)	Passenger Elevator (By Polysius)

To service the clinker silos.

Complete with all necessary controls required by State Law.

Type	:	Rack and Pinion
Elevator Capacity	:	900 lbs.
Car Size	:	11.5' x 3.7' x 7.3'
Door Opening	:	2' x 7'
Elevator Speed	:	100 fpm
Total Travel	:	190 ft.
No. of Landings	:	2
Motor Size	:	7.5 kW (10 hp)

T-10	One (1)	Passenger Elevator (By Polysius)

To service the cement silos.

Complete with all necessary controls required by State Law.

Type	:	Rack and Pinion
Elevator Capacity	:	900 lbs.
Car Size	:	11.5' x 3.7' x 7.3'
Door Opening	:	2' x 7'
Elevator Speed	:	100 fpm
Total Travel	:	206 ft.
No. of Landings	:	2
Motor Size	:	7.5 kW (10 hp)

T-11	One (1) Lot	Service Hoists (By Contractor)

To service the cement silos.

T-12 through T-99		OPEN NUMBERS

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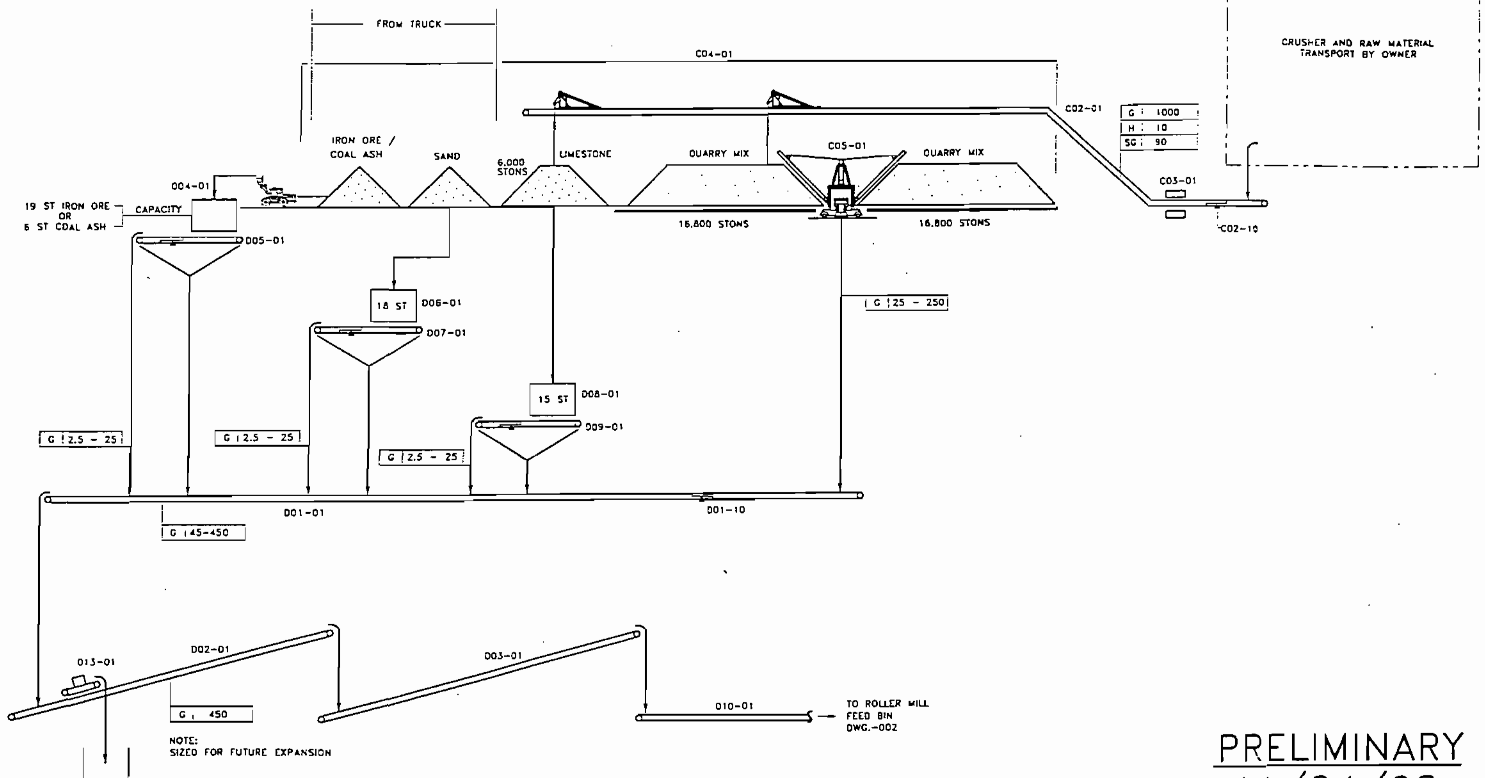

LEGEND

B	LB/H	COMBUSTIBLE FLOW
D	FT	DIAMETER
G	ST/H	MATERIAL FLOW
H	%	MATERIAL MOISTURE
HU	BTU/LB	NET CALOR VALUE
K	IN	GRAIN SIZE
KB	CM^2/G	BLAINE
KR	%	RESIDUAL 200m
M	HP	MOTOR POWER
N	RPM	SPEED
P	INWG	STAT PRESSURE
Q	BTU/H	HEAT QUANTITY
QS	mmBTU/LB	HEAT QUANTITY
S	G/FT^3	DUST CONTENT
SG	LB/FT^3	BULK DENSITY
T	°F	TEMPERATURE
TP	°F	DEW POINT
UT	°F	AMBIENT TEMPERATURE: 20°F WINTER 90°F SUMMER RELATIVE HUMIDITY: 100%
V	%	VOLATILE MATTER
VB	ACFM	GAS FLOW
VN	SCFM	GAS FLOW
VS	SCF/LB	GAS FLOW
VV	FT^3/S	GAS FLOW

PRELIMINARY
11/24/98

SUWANNEE AMERICAN CEMENT CO.
BRANFORD, FLORIDA

POLYSIUS

SUWANNEE 7400-7153

MECHANICAL PROCESS FLOW SHEET
RAW MATERIAL CRUSHING AND STORAGE

110.59.32-001

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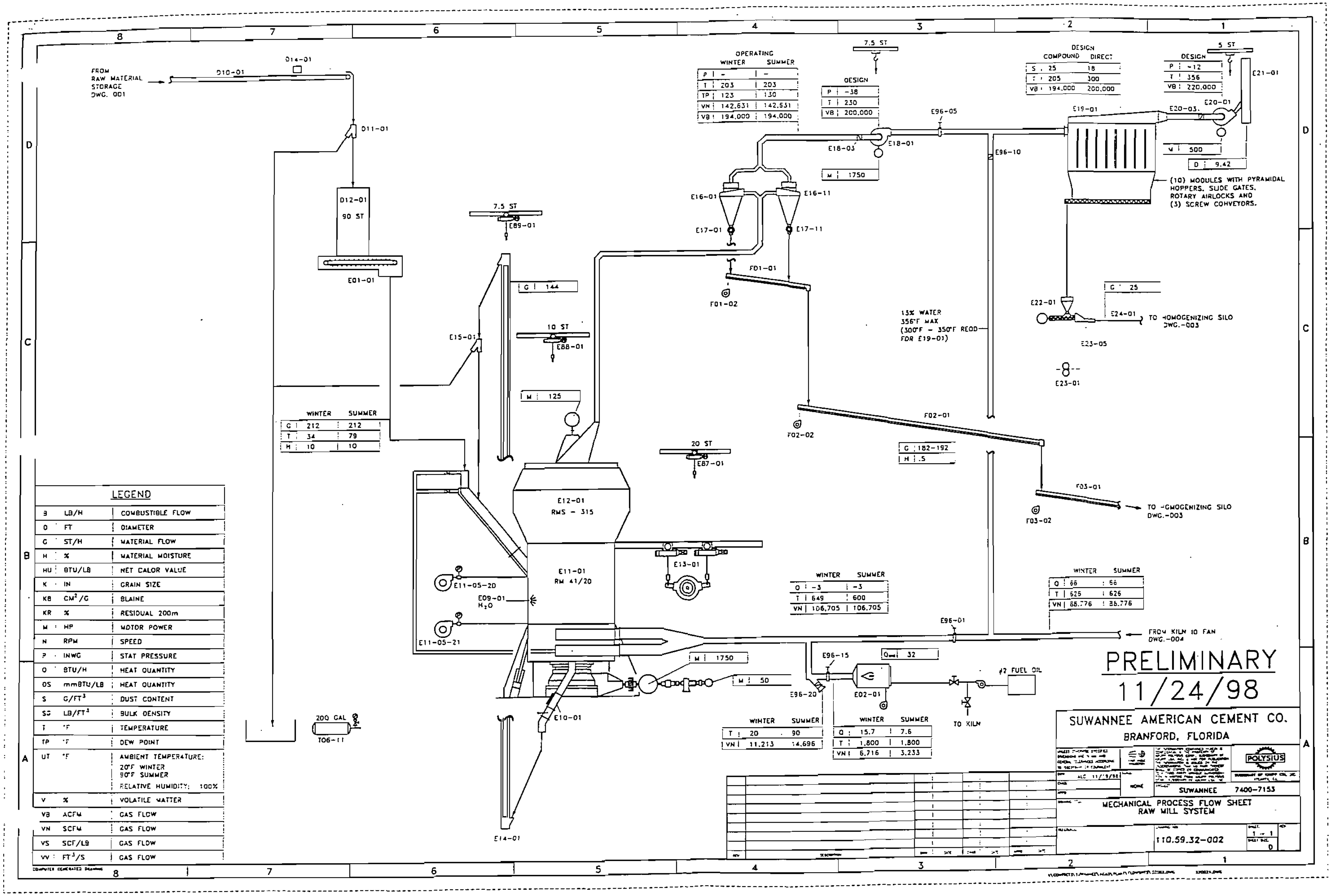

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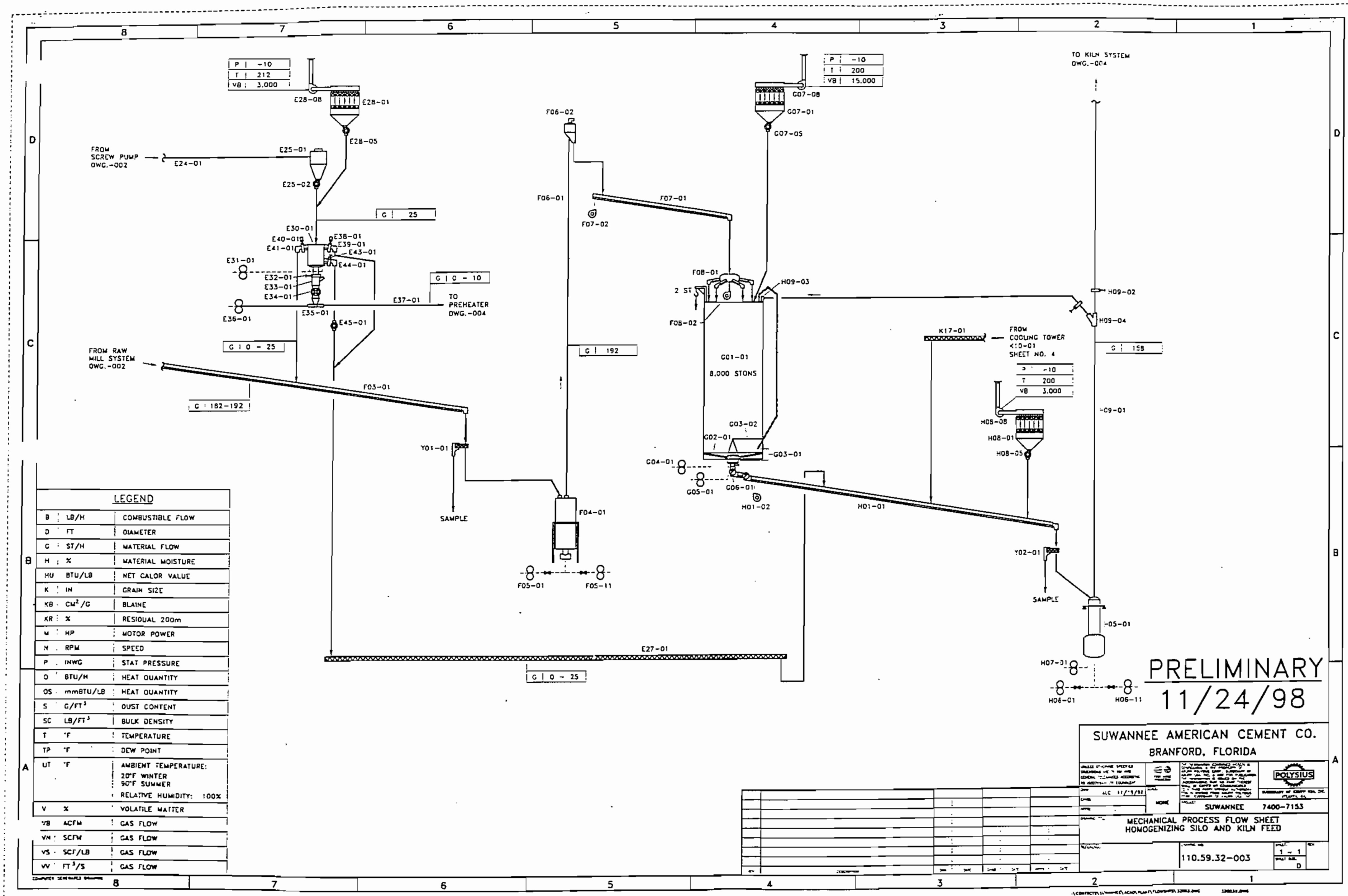

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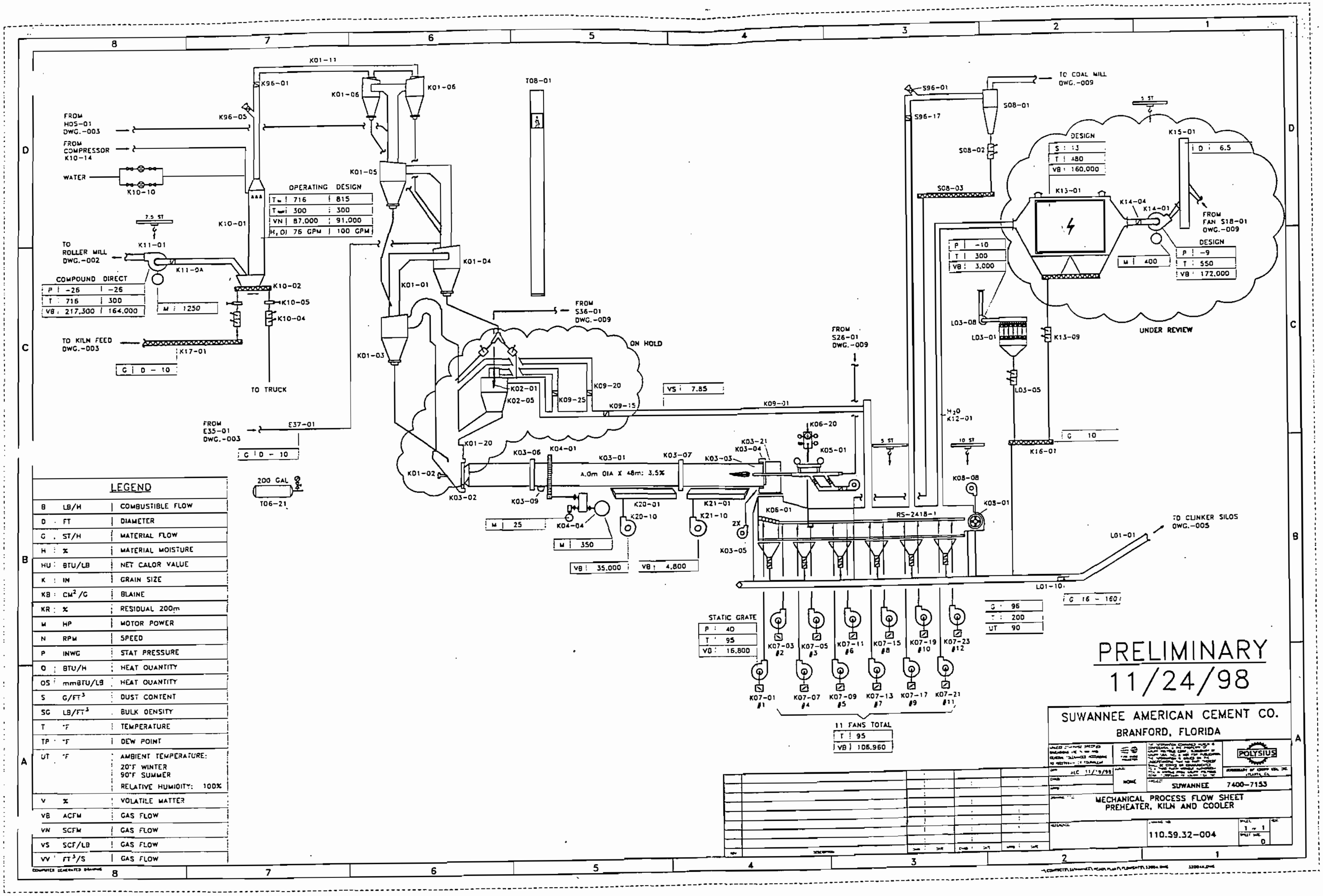

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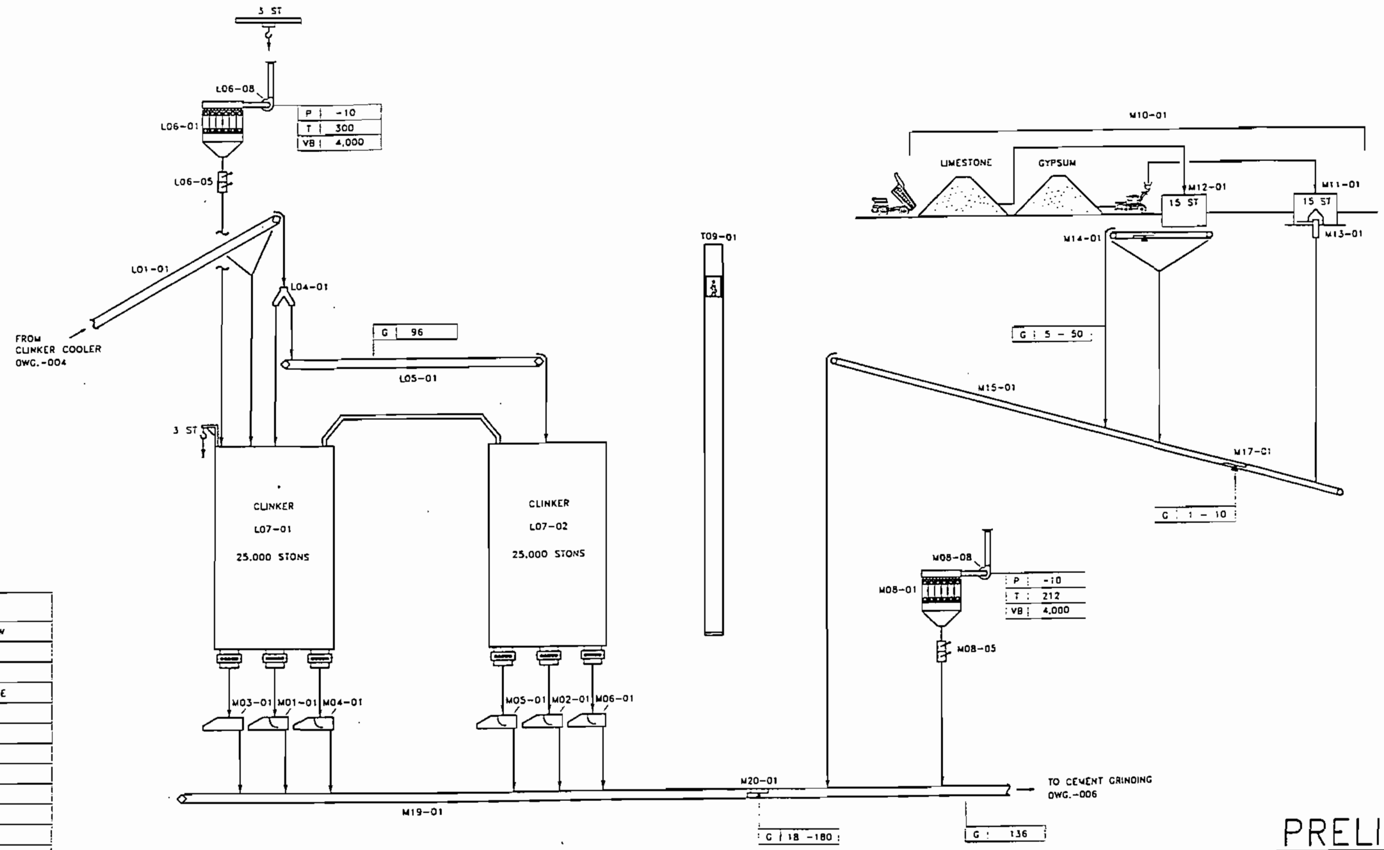

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PRELIMINARY
11/24/98

SUWANNEE AMERICAN CEMENT CO.
BRANFORD, FLORIDA

POLYSIUS

DRAWN ALC 11/19/98

SCALE NONE

PROJECT SUWANNEE 7400-7153

MECHANICAL PROCESS FLOW SHEET
CLINKER SILOS AND ADDITIVES

DRAWING NO. 110.59.32-005

SHEET 1 of 1

SHEET SIZE D

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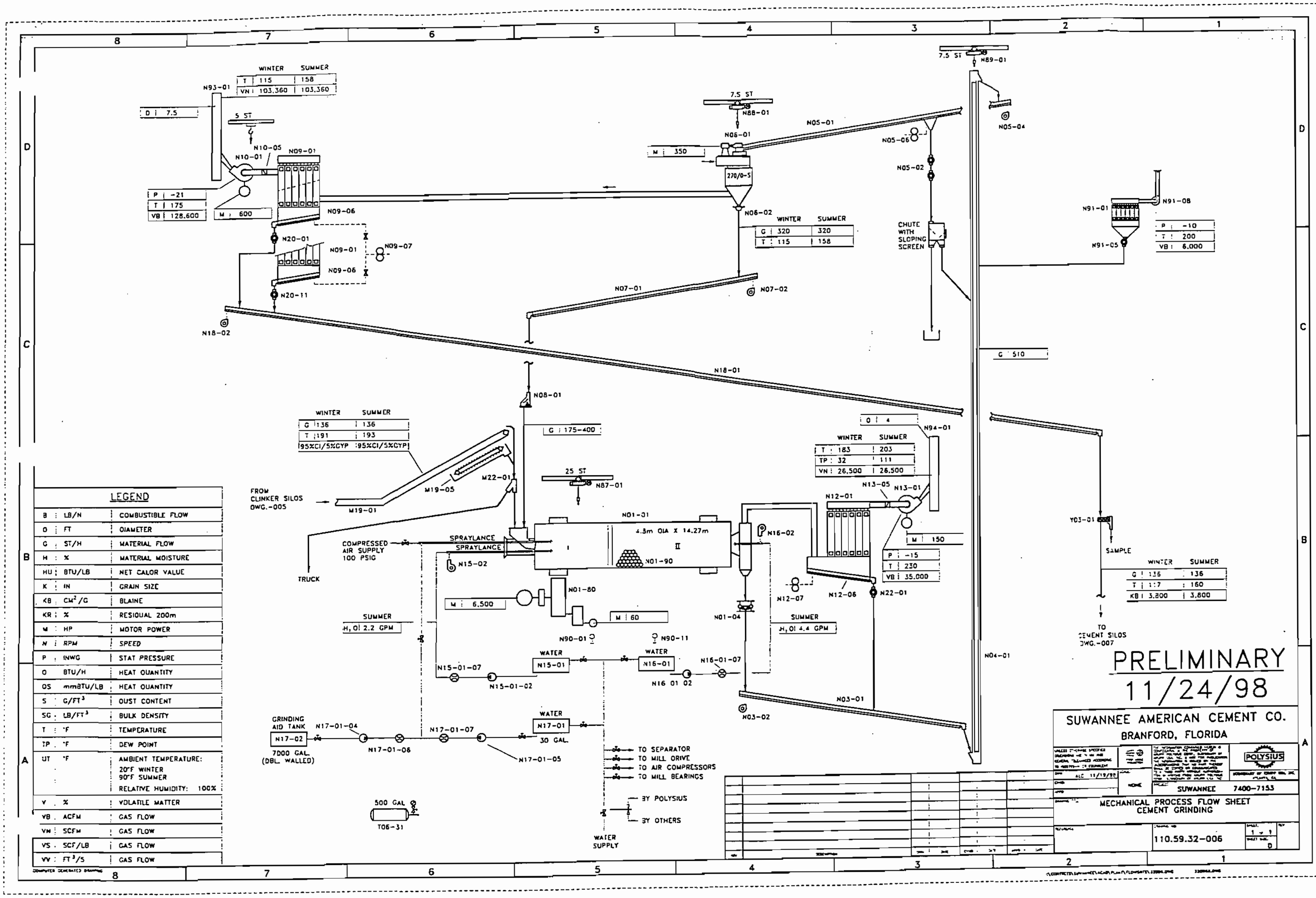

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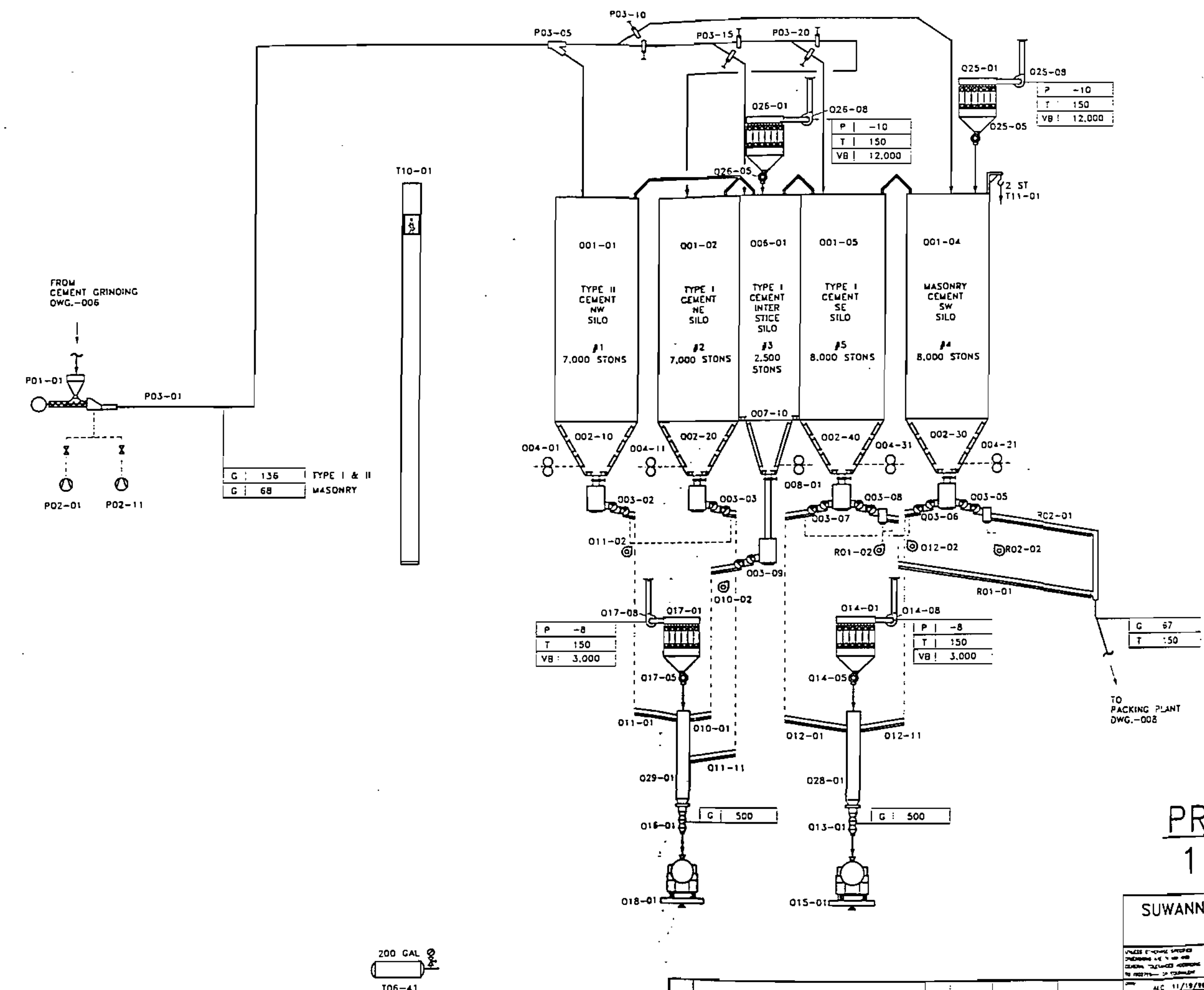

PRELIMINARY 11/24/98

LEGEND

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COMPUTER GENERATED DRAWING

SUWANNEE AMERICAN CEMENT CO.
BRANFORD, FLORIDA

MECHANICAL PROCESS FLOW SHEET CEMENT STORAGE SILOS

SUWANNEE 7400-7153

110.59.32-007

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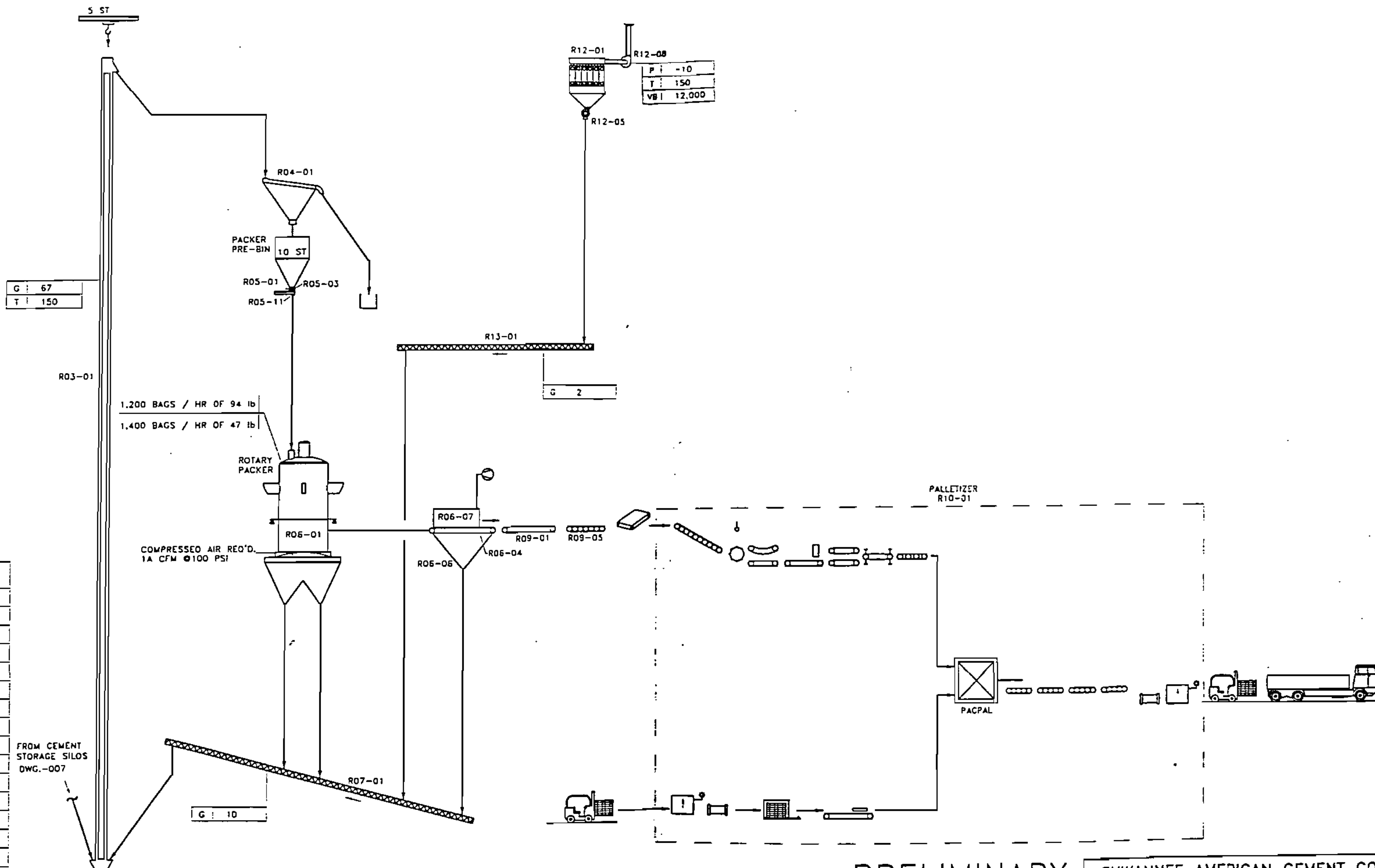

PRELIMINARY

11/24/98

LEGEND

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D	FT	DIAMETER
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VV	FT^3/S	GAS FLOW

COMPUTER GENERATED DRAWING

R97-01 CHUTES
R98-01 DEDUSTING DUCTS

SUWANNEE AMERICAN CEMENT CO.
BRANFORD, FLORIDA

POLYSIUS

ALC 11/19/98

NONE

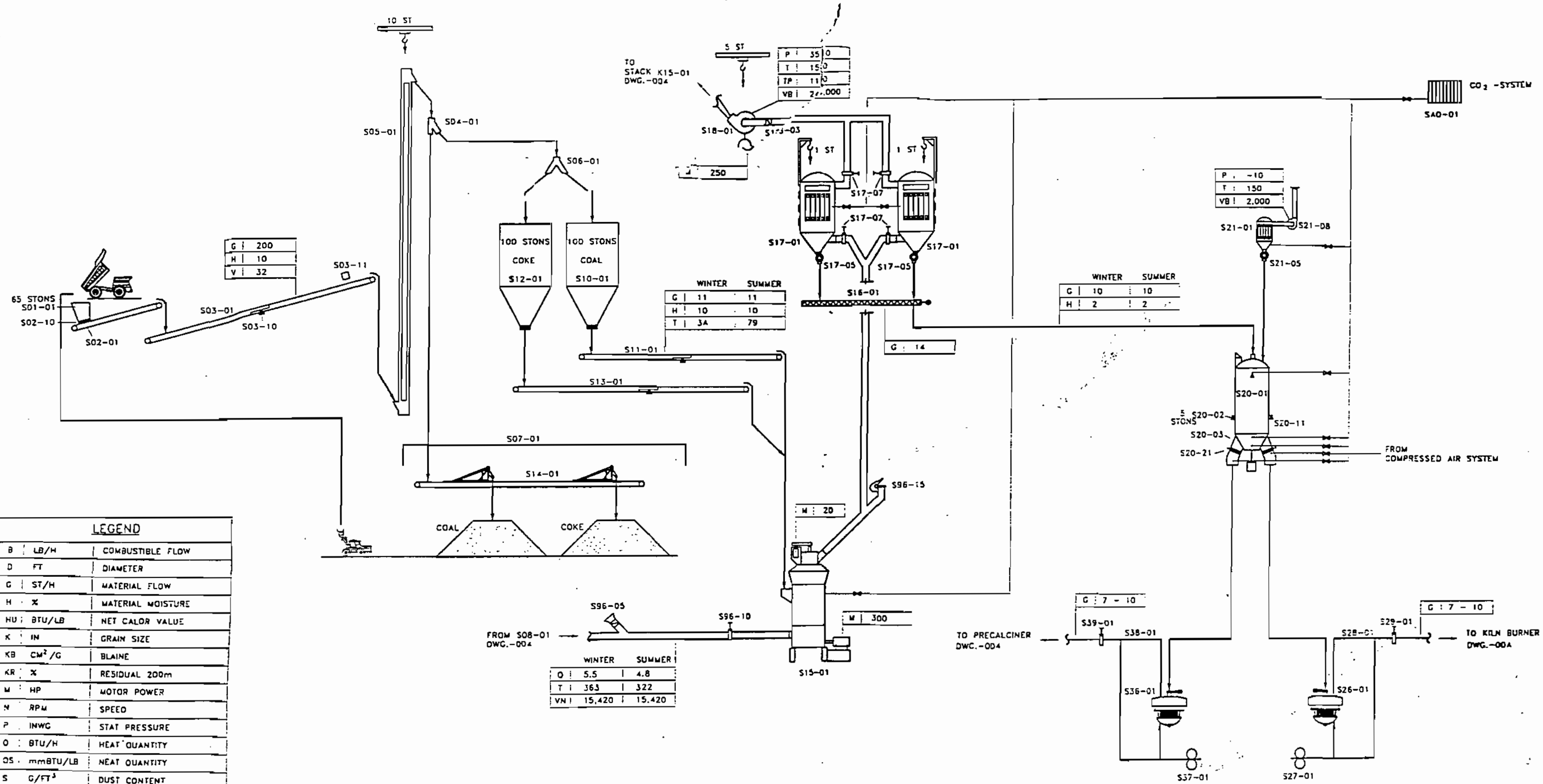
SUWANNEE 7400-7153

MECHANICAL PROCESS FLOW SHEET
PACKING PLANT

110.59.32-008

1 - 1

D



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VS	SCF/LB	GAS FLOW
VV	FT^3/S	GAS FLOW

NOTE: COAL MILL, DUCTS, WEIGHBELT FEEDERS, SCREW CONVEYOR, COAL DUST BIN, PFISTER UNITS AND BAGFILTERS ARE DESIGNED FOR 50 PSIG.

PRELIMINARY
11/24/98

SUWANNEE AMERICAN CEMENT CO.
BRANFORD, FLORIDA

POLYSIUS

ALC 11/19/98

NONE

SUWANNEE 7400-7153

MECHANICAL PROCESS FLOW SHEET
COAL STORAGE AND GRINDING

110.59.32-009

1 - 1

D

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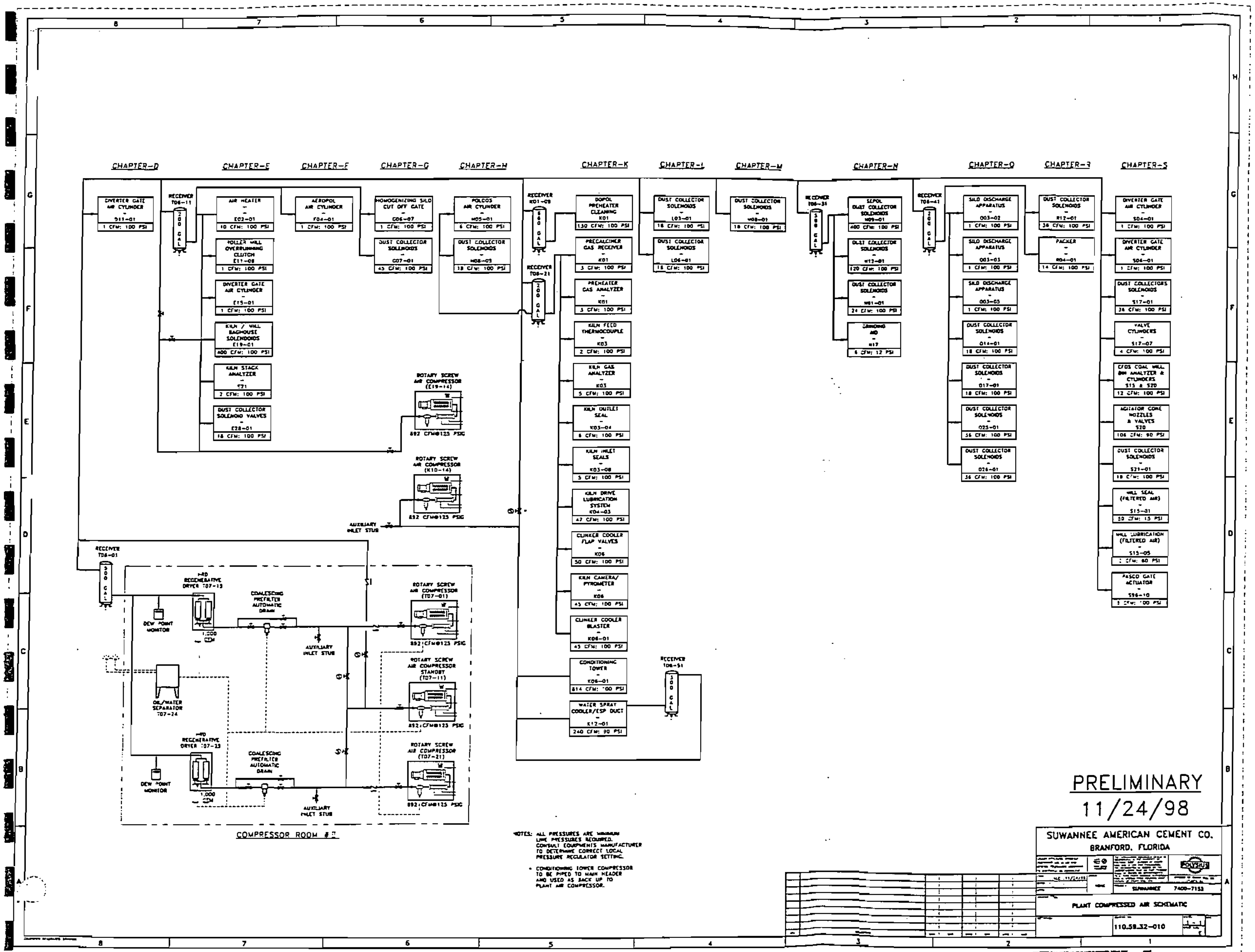

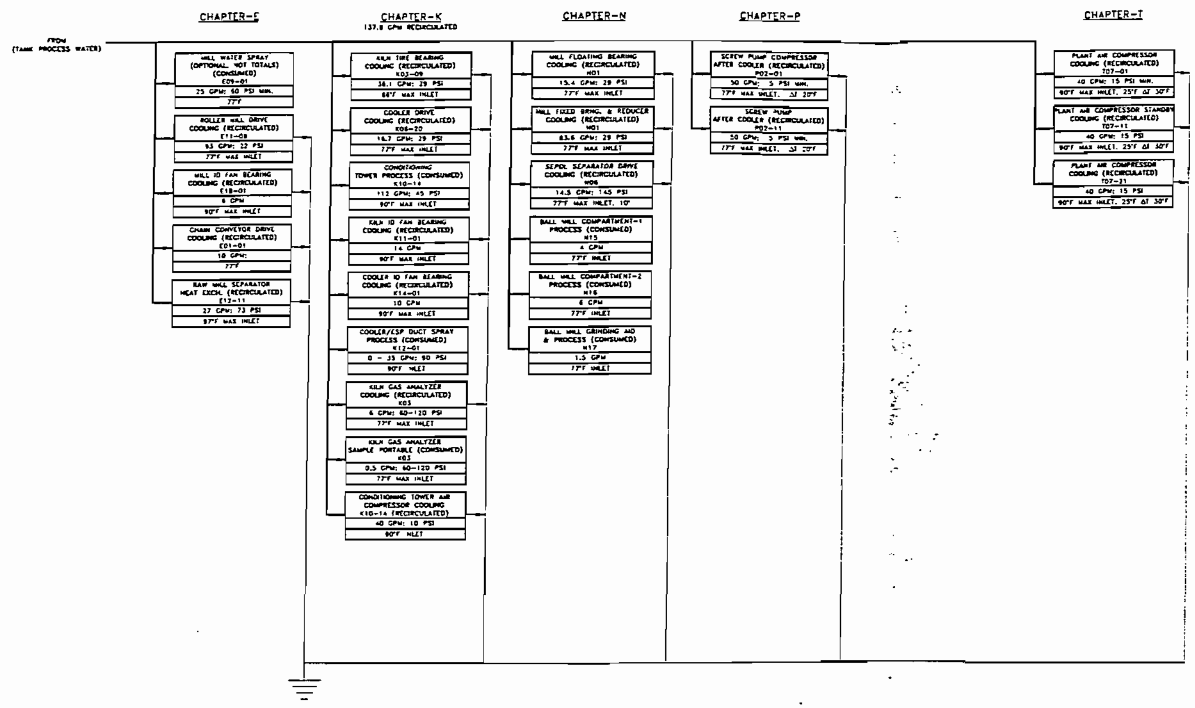

PROCESS WATER CONSUMPTION RATES:

	RECIRCULATED (GPM)	CONSUMED (GPM) ***	TOTAL (GPM)
* COMPOUND OPERATION	554	32	586
* DIRECT OPERATION	445	144	589
** EMERGENCY SHUT-DOWN (POWER FAILURE)	118	1	-

NOTES:
- * RATES ARE BASED ON POWERED VALVES ON ALL PLANT AIR COMPRESSORS.
- ** RATES ARE BASED ON POWERED VALVES STOPPING WATER FLOW TO PLANT AIR COMPRESSORS CONDITIONING TOWER COMPRESSOR AND SCREW PUMP COMPRESSORS.
- *** DOES NOT INCLUDE K12-01 COOLER/ESP DUCT SPRAY (UPSET CONDITION)

PRELIMINARY
11/24/98

SUWANNEE AMERICAN CEMENT CO.
BRANFORD, FLORIDA

SUWANNEE 7400-7153

PROCESS WATER SCHEMATIC

110.59.32-011

ATTACHMENT 3

PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

PRECAUTIONS TO LIMIT EMISSIONS OF UNCONFINED PARTICULATE MATTER (UPM)

The quarrying activities and material storage piles will involve moist or wet raw materials with negligible UPM emissions. Haul roads will be sprinkled by a water truck if this is deemed necessary. All CKD handling equipment is enclosed and vented to baghouses, resulting in negligible UPM emissions. There are no dust disposal piles planned for this facility. The manufacturing area will be paved, and all process equipment will process wet materials (moisture > 1.5%) or be vented to a particulate control device (baghouse or ESP).

The provisions of Rule 62-296.320(4)(c) shall apply to all sources of unconfined particulate matter emissions, including but not limited to vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or related activities such as loading, unloading, storing and handling.

Suwannee American Cement will follow the following protocol to limit UPM emissions:

The material handling activities at the plant covered by this protocol include loading and unloading, storage and conveying of:

- Limestone and overburden
- Iron oxide source (coal ash, iron ore, or other)
- Gypsum
- Coal
- Petroleum coke

The following reasonable precautions will be implemented at the facility:

- All materials at the plant will be stored under roof on compacted clay or concrete.
- The plant area and access roads will be paved to limit the generation of UPM from truck and equipment traffic.
- All materials are to be received and stored with excess surface moisture, or stored in closed bins.
- Water supply lines, hoses and sprinklers will be located near all material stockpiles.

ATTACHMENT 4

TYPICAL FUEL SPECIFICATIONS

TYPICAL PARAMETERS OF VARIOUS FUELS[a]

Type of Fuel	Heating Value kcal	Heating Value BTU	Sulfur % (by weight)	Ash % (by weight)
Solid Fuels				
Bituminous Coal	7,200/kg	13,000/lb	0.6-5.4	4-20
Anthracite Coal	6,810/kg	12,300/lb	0.5-1.0	7.0-16.0
Lignite (@ 35% moisture)	3,990/kg	7,200/lb	0.7	6.2
Wood (@ 40% moisture)	2,880/kg	5,200/lb	N	1-3
Bagasse (@ 50% moisture)	2,220/kg	4,000/lb	N	1-2
Bark (@ 50% moisture)	2,492/kg	4,500/lb	N	1-3[b]
Coke, Byproduct	7,380/kg	13,300/lb	0.5-1.0	0.5-5.0
Liquid Fuels				
Residual Oil	$9.98 \times 10^6/m^3$	150,000/gal	0.5-4.0	0.05-0.1
Distillate Oil	$9.30 \times 10^6/m^3$	140,000/gal	0.2-1.0	N
Diesel	$9.12 \times 10^6/m^3$	137,000/gal	0.4	N
Gasoline	$8.62 \times 10^6/m^3$	130,000/gal.	0.03-0.04	N
Kerosene	$8.32 \times 10^6/m^3$	135,000/gal	0.02-0.05	N
Liquid Petroleum Gas	$6.25 \times 10^6/m^3$	94,000/gal	N	N
Gaseous Fuels				
Natural Gas	$9,341/nm^3$	1,050/SCF	N	N
Coke Oven Gas	$5,249/nm^3$	590/SCF	0.5-2.0	N
Blast Furnace Gas	$890/nm^3$	100/SCF	N	N

[a]N = negligible.

[b]Ash content may be considerably higher when sand, dirt, etc. are present.

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GEOCHEMICAL TESTING

a division of Energy Center, Inc.

RD2, Box 124
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

ANALYSIS REPORT

Sampled by: MM

Sampling Date: 02/08/96 TO 02/08/96

Analyzed on: 04/13/96

Description: Pet Coke #1

LAB NO. 96-060256

	As Received	Dry	Dry Ash-Free
Total Moisture....D2961....	5.66		
Ash...............D3174....	3.04	3.22	
Sulfur............D4239....	3.81	4.04	
BTU/LB............D1989....	14292	15149	15654

Free Swelling Index D720 1.0

Lbs Sulfur/Million Btu 2.67

Forrest E. Walker
Director of Technical Services

MEMBER ACIL

TABLE 2-1

ANALYSES OF VARIOUS TIRES

TIRE TYPE	SOURCE	ENERGY CONTENT (BTU/LB)	COMPONENTS, PERCENT BY WEIGHT						
			MOISTURE	ASH	SULFUR	CARBON	HYDROGEN	NITROGEN	OXYGEN
FIBERGLASS	POPE, 1991	13,974	0.00	11.70	1.29	75.80	6.62	0.20	4.39
STEEL-BELTED	POPE, 1991	11,478	0.00	25.20	0.91	64.20	5.00	0.10	4.40
NYLON	POPE, 1991	14,908	0.00	7.20	1.51	78.90	6.97	< 0.10	5.42
POLYESTER	POPE, 1991	14,752	0.00	6.50	1.20	83.50	7.08	< 0.10	1.72
KEVLAR-BELTED	POPE, 1991	16,870	0.00	2.50	1.49	86.50	7.35	< 0.10	2.11
UNSPECIFIED TIRE	HALEY, 1984	16,146	0.00	1.50	1.80	89.20	7.30	0.20	NR
UNSPECIFIED TIRE	RYAN, 1989	15,550	0.50	5.70	1.20	83.20	7.10	0.30	2.50

NR - NOT REPORTED

ATTACHMENT 5

DOCUMENTATION OF AREA GROWTH

Suwannee County

COUNTY OFFICES
224 Pine Avenue
Live Oak, Florida 32060

(904) 364-3400
FAX (904) 362-1032

"In The Heart Of The Suwannee River Valley"

FAX COVER LETTER

Date: 11/20/98

TO: NAME Frank Darabi

FIRM Darabi + Assoc.

FAX 352/377-3166

FROM: NAME Robinette C Robinson

FAX 904/362-1032

PHONE 904/364-3401

TOTAL NUMBER OF PAGES INCLUDING THIS COVER LETTER: 5

MESSAGE: Some of the subdivisions + zoning application sites may fall a little outside of the six-mile radius. They're listed by section, township + range.

* * * * * * * * * * *

IF ALL PAGES ARE NOT RECEIVED,

PLEASE CALL 364-3401 AS SOON AS POSSIBLE

RECORDED SUBDIVISIONS SINCE 1977 within 6 miles of Sections 18&19-6-15

Deer Ford	49 lots	Section 23-6-15
Ichetucknee Forest	47 lots	Section 22-6-15
Circle O	8 lots	Sections 9&16-6-14
Kellers Highland	15 lots	Section 5-6-15
Kellers Highland Addition 1	3 lots	Section 5-6-15
Hillcrest Heights	48 lots	Section 16-6-14
Three Rivers Estates II	266 lots	Sections 28,29,32&33-6-15
Three Rivers Estates III	74 lots	Sections 28&33-6-15
Three Rivers Estates IV	102 lots	Section 32-6-15
Three Rivers Estates V	109 lots	Section 28-6-15
Three Rivers Estates VI	76 lots	Section 29-6-15
Three Rivers Estates VII	96 lots	Section 29-6-15
Three Rivers Estates VIII	39 lots	Section 28-6-15
Woodland Estates	7 lots	Section 9-6-14
Oakhill Farms	29 lots	Sections 5&6-6-14
Schofield Oaks	19 lots	Section 4-6-14
Little Horseshoe Extension	19 lots	Sections 3&4-7-14
Pioneer Acres	20 lots	Section 32-5-14
Forest Land	7 lots	Section 11-6-15
Bibby's Meadow	7 lots	Section 9-6-15
Little River Ranches	10 lots	Section 31-5-14
Tucknee Trails	20 lots	Sections 21&22-6-15
Timucuan Woods	8 lots	Section 22-6-15
Suwanwood	4 lots	Section 22-6-15
Terryville	10 lots	Section 15-5-15
Rolling Acres	10 lots	Section 15-5-15
Southern Comfort Estates	15 lots	Section 17-5-14

ZONING APPLICATIONS APPROVED SINCE 1982 within 6 miles of Sections 18&19-6-15

SE=Special Exception

SE-90-07-01	Residential treatment facility	Section 10-5-14
SE-93-03-01	Worship/fellowship facility	Section 10-05-14
SE-94-03-05	Solid waste collection facility	Section 12-5-14
SE-97-05-01	Automotive repair	Section 8-5-15
SE-90-05-01	Communications tower	Section 9-5-15
SE-83-06-01	Chicken houses	Section 18-5-14
SE-95-08-05	Solid waste collection facility	Section 17-5-14
SE-89-12-02	Group living facility	Section 15-5-14
SE-95-03-01	Church	Section 17-5-15
SE-85-05-01	Communications tower	Section 16-5-15
SE-96-12-04	C & D landfill	Section 19-5-14
SE-91-05-03	Group home care facility	Section 24-5-14
SE-88-02-02	Ag equipment sales/service & general engine repair	Section 21-5-15
SE-83-09-01	Telephone substation	Section 29-5-15
SE-96-06-01	Chicken houses	Section 23-4-14
SE-85-02-03	Group living facility	Section 29-5-15
SE-86-12-02	Chicken houses	Section 29-5-14
SE-95-06-03	Extension of existing chicken houses	Section 29-5-14
SE-91-01-01	Group home care facility	Section 31-5-14
SE-89-03-01	Lawn mower repair	Section 5-6-14
SE-86-09-01	Private airstrip	Section 10-6-14

11/98

SE-91-03-03	Repair of logging/forestry equipment	Section 11-6-14
SE-95-10-01	Real estate office out of home	Section 12-6-14
SE-89-05-02	Well drilling/irrigation service	Section 15-6-14
SE-92-02-02	Church	Section 15-6-14
SE-90-03-03	Upholstery shop	Section 16-6-14
SE-90-11-01	Bulk storage of LP gas	Section 15-6-14
SE-88-10-01	Chicken houses	Section 18-6-15
SE-82-10-01	General engine repair & welding	Section 18-6-15
SE-94-05-02	Solid waste collection facility	Section 18-6-15
SE-87-05-01	Chicken houses	Sections 16&17-6-15
SE-86-06-01	Real estate office	Section 21-6-14
SE-94-05-01	Off-site sign	Section 22-6-14
SE-97-08-01	Mini-storage warehouses	Section 22-6-14
SE-87-01-01	General engine repair	Section 22-6-14
SE-87-04-03	General engine repair	Section 22-6-14
SE-83-03-01	Ag sales/service & general engine repair	Section 23-6-14
SE-91-10-02	Storage & repair of equipment for ag business	Section 23-6-14
SE-86-02-02	Sawmill	Section 21-6-15
SE-88-06-02	Telephone relay station	Section 21-6-15
SE-90-02-01	Ag sales/service & general engine repair	Section 22-6-15
SE-93-05-01	Enlargement of church	Section 25-6-14
SE-92-09-02	Beauty shop	Section 21-6-15

11198

SE-93-09-01	Engine repair & welding shop	Section 21-6-15
SE-95-06-02	Wood shop	Section 22-6-15
SE-93-05-01	Enlargement of church	Section 25-6-14
SE-95-06-01	Home occupation	Section 36-6-14
SE-86-03-01	General engine repair	Section 35-6-14

RZ=Rezoning

RZ-89-03-02	Commercial Neighborhood for conv. store	Section 21-5-15
RZ-96-02-01	Commercial Neighborhood for conv. store	Section 19-6-15
RZ-96-10-01	Commercial General for office/warehouse	Section 16-6-14 (inc. land use change)

Site Plan Reviews (does not include above rezoning applications)

08/97	Dollar General	Section 16-6-14

SP=Special Permit

SP-98-07-01	Communications Tower	Section 22-6-14
SP-98-02-01	Sawmill	Section 33-6-14
SP-98-06-01	Firearm repair	Section 8-6-15

11/98

Suwannee County Building Department

220 PINE AVENUE
LIVE OAK, FLORIDA 32060
PHONE 364-3407

FAX COVER LETTER

DATE: November 20, 1998

TO: Frank Darabi

FAX #: 352/377-3166

FROM: Bobbie J. Spears, Staff Assistant

FAX #: 904/364-3754

TOTAL NUMBER OF PAGES INCLUDING THIS COVER LETTER: 1

MESSAGE: Per your request of this date the following figures are submitted for your information.

Our office was converted to computer during August 1995; therefore, these figures reflect the information from August, 1995 to the current date.

Building 564
(includes single family dwellings, room additions, commercial projects, etc.)

Travel Trailers 115

Mobile Homes 1,959

s/

2%

ATTACHMENT 6

TRANSMITTAL FOR AMBIENT IMPACT ANALYSIS COMPUTER DISKETTES

THESE DISKS CONTAIN
CARBON MONOXIDE (CO),
SULFUR DIOXIDE (SO2),
PARTICULATE MATTER (PM10), AND
OXIDES OF NITROGEN (NOX)
MODELING FILES FOR THE SUWANNEE AMERICAN CEMENT COMPANY, FACILITY IN BRANFORD FLORIDA. THE FOLLOWING FILES ARE IN SELF EXTRACTING ARCHIVE FORMAT.

DISK 1

C1ASI	EXE	175,823	11-24-98	CLASS 1 SIGNIFICANT IMPACT ANALYSIS (SIA)
C2ASI	EXE	735,517	11-24-98	CLASS 2 SIGNIFICANT IMPACT ANALYSIS
INCRMNT	EXE	304,453	11-24-98	CLASS 2 INCREMENT & AIR QUALITY STANDARD
BPIP-DW	EXE	34,803	11-24-98	BPIP BUILDING WAKE EFFECT

DISK 2

GVL-MET	EXE	543,813	11-24-98	METEOROLOGICAL DATA USED FOR THIS ANALYSIS

TO UNARCHIVE THESE FILES COPY THEM TO A HARD DISK DRIVE AND TYPE THE FILE NAME. FOR EXAMPLE TO UNARCHIVE THE CLASS 1 SIA ISCST3 OUTPUT FILES, TYPE "C1ASI" AND PRESS ENTER. THE FILES WILL AUTOMATICALLY UNARCHIVE TO THE HARD DISK DRIVE. THESE ARCHIVED FILES CONTAIN THE MODELING AND ANALYSIS FILES IN ASCII AND LOTUS FORMAT DESCRIBED AS FOLLOWS;

IN THE FILE C1ASI.EXE IS ISCST3 MODELING OF SIGNIFICANT IMPACT (SIA) FOR OKEFENOKEE N.W.R. CLASS 1 AREA.

C1ONX89	OUT	57,080	11-24-98	NOX MODELING FOR 1989
C1ONX90	OUT	57,080	11-24-98	NOX MODELING FOR 1990
C1ONX91	OUT	57,080	11-24-98	NOX MODELING FOR 1991
C1ONX92	OUT	57,080	11-24-98	NOX MODELING FOR 1992
C1ONX93	OUT	57,080	11-24-98	NOX MODELING FOR 1993
C1OPM89	OUT	138,403	11-24-98	PM10 MODELING FOR 1989
C1OPM90	OUT	138,403	11-24-98	PM10 MODELING FOR 1990
C1OPM91	OUT	138,403	11-24-98	PM10 MODELING FOR 1991
C1OPM92	OUT	138,403	11-24-98	PM10 MODELING FOR 1992
C1OPM93	OUT	138,403	11-24-98	PM10 MODELING FOR 1993
C1OSO89	OUT	99,040	11-24-98	SO2 MODELING FOR 1989
C1OSO90	OUT	99,040	11-24-98	SO2 MODELING FOR 1990
C1OSO91	OUT	99,040	11-24-98	SO2 MODELING FOR 1991
C1OSO92	OUT	99,040	11-24-98	SO2 MODELING FOR 1992
C1OSO93	OUT	99,040	11-24-98	SO2 MODELING FOR 1993

IN THE FILE C2ASI.EXE IS ISCST3 MODELING OF SIGNIFICANT IMPACT ANALYSIS (SIA) FOR SIA OF FAAQS, AND CLASS 2 AREA:

C2CO89	OUT	235,184	11-24-98	CO MODELING FOR 1989
C2CO90	OUT	235,184	11-24-98	CO MODELING FOR 1990
C2CO91	OUT	235,184	11-24-98	CO MODELING FOR 1991
C2CO92	OUT	235,184	11-24-98	CO MODELING FOR 1992
C2CO93	OUT	235,184	11-24-98	CO MODELING FOR 1993
C2NX89	OUT	171,781	11-24-98	NOX MODELING FOR 1989
C2NX90	OUT	171,781	11-24-98	NOX MODELING FOR 1990
C2NX91	OUT	171,781	11-24-98	NOX MODELING FOR 1991
C2NX92	OUT	171,781	11-24-98	NOX MODELING FOR 1992
C2NX93	OUT	171,781	11-24-98	NOX MODELING FOR 1993
C2PM89	OUT	349,148	11-24-98	PM10 MODELING FOR 1989
C2PM90	OUT	349,148	11-24-98	PM10 MODELING FOR 1990
C2PM91	OUT	349,148	11-24-98	PM10 MODELING FOR 1991
C2PM92	OUT	349,148	11-24-98	PM10 MODELING FOR 1992
C2PM93	OUT	349,148	11-24-98	PM10 MODELING FOR 1993
C2SO89	OUT	396,415	11-24-98	SO2 MODELING FOR 1989
C2SO90	OUT	396,415	11-24-98	SO2 MODELING FOR 1990
C2SO91	OUT	396,415	11-24-98	SO2 MODELING FOR 1991
C2SO92	OUT	396,415	11-24-98	SO2 MODELING FOR 1992
C2SO93	OUT	396,415	11-24-98	SO2 MODELING FOR 1993

THERE ARE RECEPTORS AT 50 METER INTERVALS ALONG THE PROPERTY LINE, DISCRETE POLAR RECEPTORS FROM 500 METERS TO 1600 METERS AND A POLAR RECEPTOR GRID FROM 1750 TO 20,000 METERS. POLAR RECEPTORS ARE CENTERED AT X=0 Y=0 THE LOCATION OF THE KILN STACK SOURCE 1 OR UNIT E21. THE UTMS COORDINATES ARE 321,400 METERS EAST, 3,315,900 METERS NORTH IN ZONE 17. NO SIGNIFICANCE WAS FOUND AT THE PSD CLASS 1 RECEPTORS NOR WAS SIGNIFICANCE FOUND FOR CO OR SO2 AT THE CLASS 2 RECEPTORS. IMPACTS PREDICTED FOR NOX AND PM10 AT THE CLASS 2 RECEPTORS, INDICATED THAT INCREMENT ANALYSIS WAS REQUIRED.

IN THE FILE INCRMNT.EXE IS CLASS 2 AREA INCREMENT AND FLORIDA AMBIENT AIR QUALITY STANDARD (FAAQS) ANALYSIS FOR THE PM10 STANDARD:

INCRNX89	OUT	176,315	11-23-98	NOX MODELING FOR 1989
INCRNX90	OUT	176,315	11-23-98	NOX MODELING FOR 1990
INCRNX91	OUT	176,315	11-23-98	NOX MODELING FOR 1991
INCRNX92	OUT	176,315	11-23-98	NOX MODELING FOR 1992
INCRNX93	OUT	176,315	11-23-98	NOX MODELING FOR 1993
INCRPM89	OUT	361,785	11-24-98	PM10 MODELING FOR 1989
INCRPM90	OUT	361,785	11-24-98	PM10 MODELING FOR 1990
INCRPM91	OUT	361,785	11-24-98	PM10 MODELING FOR 1991
INCRPM92	OUT	361,785	11-24-98	PM10 MODELING FOR 1992
INCRPM93	OUT	361,785	11-24-98	PM10 MODELING FOR 1993

THE NEAREST AVAILABLE METEOROLOGICAL DATA FOR THE MOST RECENT CONSECUTIVE YEARS OF RECORD IS FROM THE GAINESVILLE, FL SURFACE AIR AND WAYCROSS, GA UPPER AIR STATION. THE METEOROLOGICAL DATA INPUT FILES USED FOR THIS ANALYSIS ARE INCLUDED IN THE FILE GVL-MET.EXE:

GNSVL89	ASC	438,029	11-17-98	MET DATA FOR 1989
GNSVL90	ASC	438,029	11-17-98	MET DATA FOR 1990
GNSVL91	ASC	438,029	12-16-93	MET DATA FOR 1991
GNSVL92	ASC	439,229	11-17-98	MET DATA FOR 1992
GNSVL93	ASC	438,029	11-17-98	MET DATA FOR 1993

BUILDING INPUT PROFILE PROGRAM (BPIP) FILES ARE PROVIDED IN BPIP-DW.EXE, THESE BUILDING DOWNWASH CALCULATIONS ARE USED IN ALL MODELING AND ARE DIVIDED INTO TWO PARTS DUE TO SOURCE INPUT LIMITATIONS OF THE PROGRAM. THE FOLLOWING BPIP FILES ARE PROVIDED:

SOURCES 1 - 14

FRK1BPI	INP	3,761	10-29-98	INPUT
FRK1BPI	OUT	15,526	10-29-98	OUTPUT
FRK1BPI	SUM	348,278	10-29-98	SUMMARY

SOURCES 15 - 22

FRK2BPI	INP	3,482	10-27-98	INPUT
FRK2BPI	OUT	9,712	10-29-98	OUTPUT
FRK2BPI	SUM	189,530	10-29-98	SUMMARY

AND:

READ	ME	6,145	11-24-98	THIS FILE

IF I MAY PROVIDE ADDITIONAL FILES, OR CLARIFICATION PLEASE CONTACT ME.

NOVEMBER 24, 1998
MARK KOLETZKE
KOOGLER AND ASSOCIATES
(352) 377-5822
KOOGLER@WORLDNET.ATT.NET

ATTACHMENT 7

CONSTRUCTION SCHEDULE

ATTACHMENT 7 – CONSTRUCTION SCHEDULE

June 1999:
- Contractor selection
- Plans and specifications

July 1999:
- Site clearing
- Contractor mobilization

August – November 1999:
- Site work and foundations

November 1999 – March 2000:
- Major equipment delivery and erection

April – June 2000:
- Component tie-in
- Conveyors

July 2000:
- Office and lab setup

August 2000:
- Fuel and raw material delivery

October 2000:
- Trial run
- Equipment check

November 2000:
- Plant start-up

Department of Environmental Protection

DIVISION OF AIR RESOURCES MANAGEMENT

RECEIVED
NOV 30 1998
BUREAU OF AIR REGULATION

APPLICATION FOR AIR PERMIT - LONG FORM

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

This section of the Application for Air Permit form identifies the facility and provides general information on the scope and purpose of this application. This section also includes information on the owner or authorized representative of the facility (or the responsible official in the case of a Title V source) and the necessary statements for the applicant and professional engineer, where required, to sign and date for formal submittal of the Application for Air Permit to the Department. If the application form is submitted to the Department using ELSA, this section of the Application for Air Permit must also be submitted in hard-copy.

Identification of Facility Addressed in This Application

Enter the name of the corporation, business, governmental entity, or individual that has ownership or control of the facility; the facility site name, if any; and the facility's physical location. If known, also enter the facility identification number.

1. Facility Owner/Company Name: **Suwannee American Cement Company**	
2. Site Name: **Branford Plant**	
3. Facility Identification Number: **New Facility** [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **U.S. 27 at C.R. 49, 3.7 mi. East of Branford** City: **Branford** County: **Suwannee** Zip Code: **32008**	
5. Relocatable Facility? [ ] Yes [**X**] No	6. Existing Permitted Facility? [ ] Yes [**X**] No

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	November 30, 1998
2. Permit Number:	1210465-001-AC
3. PSD Number (if applicable):	PSD-FL-259
4. Siting Number (if applicable):	

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
Joe Anderson, III – President

2. Owner/Authorized Representative or Responsible Official Mailing Address:

Organization/Firm: **Suwannee American Cement Company, Inc.**
Street Address: **Post Office Box 410**
City: **Branford** State: **FL** Zip Code: **32008**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
Telephone: **(352) 542-7942** Fax: **(352) 542-3417**

4. Owner/Authorized Representative or Responsible Official Statement:

I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

[signature] 11-25-98
Signature Date

* Attach letter of authorization if not currently on file.

Scope of Application

This Application for Air Permit addresses the following emissions unit(s) at the facility. An Emissions Unit Information Section (a Section III of the form) must be included for each emissions unit listed.

Emissions Unit ID	Description of Emissions Unit	Permit Type
NO CORRESPONDING I.D.	**Raw Material Processing: Quarry to Storage**	
NO CORRESPONDING I.D.	**Raw Material Processing: Storage to Raw Mill**	
NO CORRESPONDING I.D.	**In-Line Kiln/Raw Mill**	
NO CORRESPONDING I.D.	**Clinker Cooler**	
NO CORRESPONDING I.D.	**Clinker and Cement Processing**	
NO CORRESPONDING I.D.	**Coal Processing**	

Purpose of Application and Category

Check one (except as otherwise indicated):

Category I: All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: ______________________

[ ] Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed: ______________________

[ ] Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: ______________________

Operation permit to be revised: ______________________

[ ] Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. Also check Category III.

Operation permit to be revised/corrected: ______________________

[ ] Air operation permit revision for a Title V source for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit to be revised: ______________________

Reason for revision: ______________________

____

Category II: All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s): ____________________

[ ] Renewal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed: ____________________

[ ] Air operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g., to address one or more newly constructed or modified emissions units.

Operation permit to be revised: ____________________

Reason for revision: ____________________

Category III: All Air Construction Permit Applications for All Facilities and Emissions Units

This Application for Air Permit is submitted to obtain:

[X] Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any: **New Facility**

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s): ____________________

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

4. Professional Engineer Statement:

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

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

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

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

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

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

Signature _______________ Date 11/25/98

(seal) STEVEN C. CULLEN CERTIFICATE STATE OF FLORIDA REGISTERED ENGINEER

* Attach any exception to certification statement.

DEP Form No. 62-210.900(1) - Form
Effective: 3-21-96

Application Contact

1. Name and Title of Application Contact: **Steve Cullen – Project Engineer**
2. Application Contact Mailing Address: Organization/Firm: **Koogler & Associates** Street Address: **4014 NW 13th Street** City: **Gainesville** State: **FL** Zip Code: **32609**
3. Application Contact Telephone Numbers: Telephone: **(352) 377-5822** Fax: **(352) 377-7158**

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **321.4** North (km): **3315.9**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **29/57/45** Longitude (DD/MM/SS): **82/51/03**			
3. Governmental Facility Code: **0**	4. Facility Status Code: **C**	5. Facility Major Group SIC Code: **32**	6. Facility SIC(s): **3241**
7. Facility Comment (limit to 500 characters):			

Facility Contact

1. Name and Title of Facility Contact: **Frank Darabi, P.E.**
2. Facility Contact Mailing Address: Organization/Firm: **Darabi and Associates** Street Address: **730 North Waldo Road** City: **Gainesville** State: **FL** Zip Code: **32601**
3. Facility Contact Telephone Numbers: Telephone: **(352) 376-6533** Fax: **(352) 377-3166**

Facility Regulatory Classifications

1. Small Business Stationary Source?		
[ ] Yes	[ ] No	[X] Unknown
2. Title V Source?		
[X] Yes	[ ] No	
3. Synthetic Non-Title V Source?		
[ ] Yes	[X] No	
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?		
[X] Yes	[ ] No	
5. Synthetic Minor Source of Pollutants Other than HAPs?		
[ ] Yes	[X] No	
6. Major Source of Hazardous Air Pollutants (HAPs)?		
[X] Yes	[ ] No	
7. Synthetic Minor Source of HAPs?		
[ ] Yes	[X] No	
8. One or More Emissions Units Subject to NSPS?		
[X] Yes	[ ] No	
9. One or More Emission Units Subject to NESHAP?		
[X] Yes	[ ] No	
10. Title V Source by EPA Designation?		
[ ] Yes	[X] No	

11. Facility Regulatory Classifications Comment (limit to 200 characters):

NSPS Subpart F: Standards of Performance for Portland Cement Plants
NSPS Subpart Y: Standards of Performance for Coal Preparation Plants
NSPS Subpart OOO: Standards of Performance for Nonmetallic Mineral Processing Plants
Proposed NESHAP Subpart LLL: Standards for HAP Emissions for Portland Cement Manufacturing

B. FACILITY REGULATIONS

<u>Rule Applicability Analysis</u> (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

NA

<u>List of Applicable Regulations</u> (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

STATE AIR REGULATIONS	
62-4, FAC	**62-204, FAC**
62-210, FAC	**62-212, FAC**
62-213, FAC	**62-296, FAC**
62-297, FAC	
FEDERAL AIR REGULATIONS	
NSPS Subpart F	**NSPS Subpart Y**
NSPS Subpart OOO	**Proposed NESHAP Subpart LLL**

C. FACILITY POLLUTANTS

Facility Pollutant Information

1. Pollutant Emitted	2. Pollutant Classification
PM	**A**
PM10	**A**
SO2	**A**
NOX	**A**
CO	**A**
HAPS	**A**
H106	**A**
DIOX	**B**
VOC	**B**

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Detail Information: Pollutant ______ of ______

1. Pollutant Emitted: **NA**		
2. Requested Emissions Cap:	(lb/hour)	(tons/year)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

Facility Pollutant Detail Information: Pollutant ______ of ______

1. Pollutant Emitted: **NA**		
2. Requested Emissions Cap:	(lb/hour)	(tons/year)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

E. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location: [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
2. Facility Plot Plan: [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
3. Process Flow Diagram(s): [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
5. Fugitive Emissions Identification: [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

7. List of Proposed Exempt Activities: [ ] Attached, Document ID:________ [X] Not Applicable
8. List of Equipment/Activities Regulated under Title VI: [ ] Attached, Document ID:________ [ ] Equipment/Activities On site but Not Required to be Individually Listed [X] Not Applicable
9. Alternative Methods of Operation: [ ] Attached, Document ID:________ [X] Not Applicable
10. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:________ [X] Not Applicable

11. Identification of Additional Applicable Requirements: [ ] Attached, Document ID:_______ [**X**] Not Applicable
12. Compliance Assurance Monitoring Plan: [ ] Attached, Document ID:_______ [**X**] Not Applicable
13. Risk Management Plan Verification: [ ] Plan Submitted to Implementing Agency - Verification Attached, Document ID:_______ [ ] Plan to be Submitted to Implementing Agency by Required Date [**X**] Not Applicable
14. Compliance Report and Plan: [ ] Attached, Document ID:_______ [**X**] Not Applicable
15. Compliance Certification (Hard-copy Required): [ ] Attached, Document ID:_______ [**X**] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one:

[**X**] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

2. Single Process, Group of Processes, or Fugitive Only? Check one:

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

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

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

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Raw Material Processing: Quarry to Storage**		
2. Emissions Unit Identification Number: [X] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code: **C**	4. Acid Rain Unit? [ ] Yes [X] No	5. Emissions Unit Major Group SIC Code: **32**
6. Emissions Unit Comment (limit to 500 characters): **This emissions unit covers raw material (limestone and overburden) processing from the quarry up to raw material storage.**		

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **NA**
2. Control Device or Method Code:

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date: **NA**		
2. Long-term Reserve Shutdown Date: **NA**		
3. Package Unit: **NA** Manufacturer:	Model Number:	
4. Generator Nameplate Rating: **NA**	MW	
5. Incinerator Information: **NA** Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate: **NA**		mmBtu/hr
2. Maximum Incineration Rate: **NA**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **1000 TPH to Primary Crusher** **1,679,000 TPY wet raw material**		
4. Maximum Production Rate: **NA**		
5. Operating Capacity Comment (limit to 200 characters): **NA**		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	**8760** hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

NA

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

STATE AIR REGULATIONS	
62-4, FAC	62-204, FAC
62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
FEDERAL AIR REGULATIONS	
NSPS Subpart OOO	

E. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **Quarry**
2. Emission Point Type Code: [ ] 1 [ ] 2 [X] 3 [ ] 4
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): • **In-pit primary crusher** • **Belt conveyor transfer points up to raw material storage** • **Unloading at raw material storage**
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **NA**
5. Discharge Type Code: [ ] D [X] F [ ] H [ ] P [ ] R [ ] V [ ] W
6. Stack Height: **NA** feet
7. Exit Diameter: **NA** feet
8. Exit Temperature: **Ambient** °F

9. Actual Volumetric Flow Rate: **NA**	acfm
10. Percent Water Vapor : **NA**	%
11. Maximum Dry Standard Flow Rate: **NA**	dscfm
12. Nonstack Emission Point Height:	**0** feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters):	

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 3

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters):

Mineral Products: Cement Manufacturing: Dry Process: Primary Crushing

2. Source Classification Code (SCC): **3-05-006-09**

3. SCC Units: **Tons Processed**

4. Maximum Hourly Rate: **1000**

5. Maximum Annual Rate: **1,679,000**

6. Estimated Annual Activity Factor: **NA**

7. Maximum Percent Sulfur: **NA**

8. Maximum Percent Ash: **NA**

9. Million Btu per SCC Unit: **NA**

10. Segment Comment (limit to 200 characters):

Raw material at 15% moisture.
Dry preheater feed = 0.85 x 1,679,000 = 1,427,150 TPY

Segment Description and Rate: Segment 2 of 3

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Raw Material Transfer**	
2. Source Classification Code (SCC): **3-05-006-12**	
3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **1000**	5. Maximum Annual Rate: **1,679,000**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **NA**	
10. Segment Comment (limit to 200 characters): **Raw material at 15% moisture.** **Dry preheater feed = 0.85 x 1,679,000 = 1,427,150 TPY**	

Segment Description and Rate: Segment 3 of 3

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Raw Material Unloading**	
2. Source Classification Code (SCC): **3-05-006-07**	
3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **1000**	5. Maximum Annual Rate: **1,679,000**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **NA**	
10. Segment Comment (limit to 200 characters): **Raw material at 15% moisture.** **Dry preheater feed = 0.85 x 1,679,000 = 1,427,150 TPY**	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
PM10			NS

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information: Pollutant 1 of 2

1. Pollutant Emitted: **PM**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**0.90** lb/hour	**0.8** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **0.0009 lb/ton** Reference: **AP-42 Table 11.19.2-2 (crushing + transfer + unloading)**		
7. Emissions Method Code: [ ] 0 [ ] 1 [ ] 2 [X] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **1000 TPH x 0.0009 lb/ton = 0.90 lb/hour** **1,679,000 TPY x 0.0009 lb/ton = 0.8 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **NA**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

B.

1. Basis for Allowable Emissions Code: **NA**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hr tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

Pollutant Detail Information: Pollutant 2 of 2

1. Pollutant Emitted: **PM10**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**0.80** lb/hour	**0.7** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **0.0008 lb/ton** Reference: **AP-42 Table 11.19.2-2 (crushing + transfer + unloading)**		
7. Emissions Method Code: [ ] 0 [ ] 1 [ ] 2 [X] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **1000 TPH x 0.0008 lb/ton = 0.80 lb/hour** **1,679,000 TPY x 0.0008 lb/ton = 0.7 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

B.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE10**	
2. Basis for Allowable Opacity: [X] Rule [ ] Other **40 CFR 60.672(b)**	
3. Requested Allowable Opacity: Normal Conditions: **10%** Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **This opacity limitation applies to belt conveyor transfer points.**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE15**	
2. Basis for Allowable Opacity: [X] Rule [ ] Other **40 CFR 60.672(c)**	
3. Requested Allowable Opacity: Normal Conditions: **15%** Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **This opacity limitation applies to the in-pit primary crusher.**	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: **NA**	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: **NA**	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION (Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter ~~or Sulfur Dioxide~~?

   If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

   [ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [X] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide? **NA**

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[**X**] C	[ ] E	[ ] Unknown
SO2	[ ] C	[ ] E	[ ] Unknown
NO2	[ ] C	[ ] E	[ ] Unknown

4. Baseline Emissions:		
PM	**0** lb/hour	**0** tons/year
SO2	lb/hour	tons/year
NO2		tons/year

5. PSD Comment (limit to 200 characters):

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements for All Applications

1. Process Flow Diagram [X] Attached, Document ID: **PSD Report**			[ ] Not Applicable
2. Fuel Analysis or Specification [ ] Attached, Document ID:________	[X] Not Applicable		[ ] Waiver Requested
3. Detailed Description of Control Equipment [ ] Attached, Document ID:________	[X] Not Applicable		[ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:________	[X] Not Applicable		[ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:_______________ [X] Not Applicable			
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________	[X] Not Applicable		
7. Operation and Maintenance Plan [ ] Attached, Document ID:________	[X] Not Applicable		
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: **PSD Report**			[ ] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:________	[X] Not Applicable		

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operation [ ] Attached, Document ID:________ [X] Not Applicable
11. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
12. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [X] Not Applicable
13. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [X] Not Applicable
14. Acid Rain Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one:

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

2. Single Process, Group of Processes, or Fugitive Only? Check one:

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

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

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

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

2. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Raw Material Processing: Storage to Raw Mill**		
2. Emissions Unit Identification Number: [**X**] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code: **C**	4. Acid Rain Unit? [ ] Yes [**X**] No	5. Emissions Unit Major Group SIC Code: **32**
6. Emissions Unit Comment (limit to 500 characters): **This emissions unit covers from raw material storage up to the preheater. This emissions unit also includes the recycling of captured particulate matter.**		

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **Fabric Filters – High Temperature** • **E-29: Recycle dust from main baghouse** • **E-28: Recycle dust to blend silo**
2. Control Device or Method Code: **016**

B.

1. Description (limit to 200 characters): **Fabric Filters – Medium Temperature** • **G-07: Raw meal to blend silo from raw mill** • **H-08: Raw meal from blend silo to preheater**
2. Control Device or Method Code: **017**

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date: **NA**		
2. Long-term Reserve Shutdown Date: **NA**		
3. Package Unit: **NA** Manufacturer:	Model Number:	
4. Generator Nameplate Rating: **NA**	MW	
5. Incinerator Information: **NA** Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate: **NA**		mmBtu/hr
2. Maximum Incineration Rate: **NA**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **163.0 TPH dry feed to preheater**		
4. Maximum Production Rate: **NA**		
5. Operating Capacity Comment (limit to 200 characters): **NA**		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	**8760** hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

NA

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

STATE AIR REGULATIONS	
62-4, FAC	62-204, FAC
62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
FEDERAL AIR REGULATIONS	
NSPS Subpart F	Proposed NESHAP Subpart LLL

E. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **E-28, E-29, G-07, H-08**	
2. Emission Point Type Code: [ ] 1 [ ] 2 [X] 3 [ ] 4	
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): • **E-29: Recycle dust from main baghouse** • **E-28: Recycle dust to blend silo** • **G-07: Raw meal to blend silo from raw mill** • **H-08: Raw meal from blend silo to preheater**	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **NA**	
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [X] V [ ] W	
6. Stack Height: **See Table**	feet
7. Exit Diameter: **See Table**	feet
8. Exit Temperature: **See Table**	°F

9. Actual Volumetric Flow Rate: **See Table**	acfm
10. Percent Water Vapor : **See Table**	%
11. Maximum Dry Standard Flow Rate: **See Table**	dscfm
12. Nonstack Emission Point Height: **NA**	feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters):	

	HEIGHT FT.	DIAM. FT.	TEMP. °F	ACFM	H20	DSCFM
E-28	40	2.2	350	15,000	2%	9582
E-29	10	0.6	356	1,000	2%	634
G-07	225	2.2	200	15,000	2%	11760
H-08	60	1.4	200	6,000	2%	4704
					Total =	**26680**

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Raw Material Transfer**	
2. Source Classification Code (SCC): **3-05-006-12**	
3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **163**	5. Maximum Annual Rate: **1,427,150**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **NA**	
10. Segment Comment (limit to 200 characters): **Raw meal from blend silo: Dry preheater feed**	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			**EL**
PM10			**NS**

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information: Pollutant 1 of 2

1. Pollutant Emitted: **PM**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**2.29** lb/hour	**10.0** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **0.01 gr/dscf** Reference: **Vendor guarantee**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **26,680 dscfm x 0.01 gr/dscf x 60 min/hr x 1.0 lb/7000 grains = 2.29 lb/hr** **2.29 lb/hr x 8760 hr/yr x 1.0 ton/2000 lb. = 10.0 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**	
2. Future Effective Date of Allowable Emissions: **NA**	
3. Requested Allowable Emissions and Units: **0.01 gr/dscf**	
4. Equivalent Allowable Emissions: **2.29** lb/hour	**10.0** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9 in lieu of Method 5**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

B.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

Pollutant Detail Information: Pollutant 2 of 2

1. Pollutant Emitted: **PM10**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**1.94** lb/hour	**8.5** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **85% of PM** Reference: **AP-42, 5th Edition, Table 11.6-5**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **0.85 x 26,680 dscfm x 0.01 gr/dscf x 60 min/hr x 1.0 lb/7000 grains = 1.94 lb/hr** **1.94 lb/hr x 8760 hr/yr x 1.0 ton/2000 lb. = 8.5 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

B.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE05**	
2. Basis for Allowable Opacity: [X] Rule [ ] Other **62-297.620(4), FAC**	
3. Requested Allowable Opacity: Normal Conditions: 5% Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters):	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE10**	
2. Basis for Allowable Opacity: [X] Rule [ ] Other **40 CFR 60.62(c) & Proposed 40 CFR 63.1346**	
3. Requested Allowable Opacity: Normal Conditions: 10% Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters):	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: **NA**	2. Pollutant(s):
3. CMS Requirement: [ ] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: **NA**	2. Pollutant(s):
3. CMS Requirement: [ ] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION (Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter ~~or Sulfur Dioxide~~?

   If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

   [ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [X] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide? **NA**

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[X] C	[ ] E	[ ] Unknown
SO2	[ ] C	[ ] E	[ ] Unknown
NO2	[ ] C	[ ] E	[ ] Unknown
4. Baseline Emissions:			
PM		**0** lb/hour	**0** tons/year
SO2		lb/hour	tons/year
NO2			tons/year
5. PSD Comment (limit to 200 characters):			

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements for All Applications

1. Process Flow Diagram [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
2. Fuel Analysis or Specification [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
3. Detailed Description of Control Equipment [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested	
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable	
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:________ [X] Not Applicable	

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operation
    [ ] Attached, Document ID:________ [X] Not Applicable

11. Alternative Modes of Operation (Emissions Trading)
    [ ] Attached, Document ID:________ [X] Not Applicable

12. Identification of Additional Applicable Requirements
    [ ] Attached, Document ID:________ [X] Not Applicable

13. Compliance Assurance Monitoring Plan
    [ ] Attached, Document ID:________ [X] Not Applicable

14. Acid Rain Application (Hard-copy Required)

    [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
    Attached, Document ID:________

    [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
    Attached, Document ID:________

    [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
    Attached, Document ID:________

    [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
    Attached, Document ID:________

    [X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one:

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

2. Single Process, Group of Processes, or Fugitive Only? Check one:

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

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

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

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **In-Line Kiln/Raw Mill**		
2. Emissions Unit Identification Number: [**X**] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code: **C**	4. Acid Rain Unit? [ ] Yes [**X**] No	5. Emissions Unit Major Group SIC Code: **32**
6. Emissions Unit Comment (limit to 500 characters): **This emissions unit covers the pyroprocessing system from the raw mill to the clinker cooler.**		

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **Fabric Filter – High Temperature** **Main Baghouse**
2. Control Device or Method Code: **016**

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date: **NA**	
2. Long-term Reserve Shutdown Date: **NA**	
3. Package Unit: **NA** Manufacturer:	 Model Number:
4. Generator Nameplate Rating: **NA**	MW
5. Incinerator Information: **NA** Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:	 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate:		**364** mmBtu/hr
2. Maximum Incineration Rate: **NA**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **NA**		
4. Maximum Production Rate: **2300 tons/day clinker**		
5. Operating Capacity Comment (limit to 200 characters): **NA**		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:	
hours/day	days/week
weeks/year	**8760** hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

NA

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

STATE AIR REGULATIONS	
62-4, FAC	62-204, FAC
62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
FEDERAL AIR REGULATIONS	
NSPS Subpart F	Proposed NESHAP Subpart LLL

E. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **E-21 Stack**
2. Emission Point Type Code: [**X**] 1 [ ] 2 [ ] 3 [ ] 4
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **NA**
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **NA**
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [**X**] V [ ] W
6. Stack Height: **250** feet
7. Exit Diameter: **9.42** feet
8. Exit Temperature: (Compound Operation) **205°F**

9. Actual Volumetric Flow Rate:	**194,000** acfm
10. Percent Water Vapor :	**6.5%**
11. Maximum Dry Standard Flow Rate:	**144,000** dscfm
12. Nonstack Emission Point Height: **NA**	feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters):	

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 5

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Preheater/Precalciner Kiln**	
2. Source Classification Code (SCC): **3-05-006-23**	
3. SCC Units: **Tons Clinker**	
4. Maximum Hourly Rate: **95.83 (24-hr avg)**	5. Maximum Annual Rate: **839,500**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **NA**	
10. Segment Comment (limit to 200 characters):	

Segment Description and Rate: Segment 2 of 5

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **In-Process Fuel Use: Bituminous Coal: Cement Kiln**	
2. Source Classification Code (SCC): **3-90-002-01**	
3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **14.6**	5. Maximum Annual Rate: **127,896**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **1.5**	8. Maximum Percent Ash: **10.0**
9. Million Btu per SCC Unit: **25**	
10. Segment Comment (limit to 200 characters): **Coal at 12,500 Btu/lb as a primary fuel** **364 mmBtu/hr ÷ 25 mmBtu/ton = 14.6 tons/hr**	

Segment Description and Rate: Segment 3 of 5

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **In-Process Fuel Use: Coke: General**	
2. Source Classification Code (SCC): **3-90-008-99**	
3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **13.0**	5. Maximum Annual Rate: **113,880**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **28**	
10. Segment Comment (limit to 200 characters): **Petroleum coke at 14,000 Btu/lb as a primary fuel** **364 mmBtu/hr ÷ 28 mmBtu/ton = 13.0 tons/hr**	

Segment Description and Rate: Segment 4 of 5

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **In-Process Fuel Use: Natural Gas: Cement Kiln**	
2. Source Classification Code (SCC): **3-90-006-02**	
3. SCC Units: **Million Cubic Feet Burned**	
4. Maximum Hourly Rate: **0.35**	5. Maximum Annual Rate: **3,066**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **1050**	
10. Segment Comment (limit to 200 characters): **Natural gas as a startup and supplemental fuel** **364 mmBtu/hr ÷ 1050 mmBtu/mmcf = 0.35 mmcf/hr**	

Segment Description and Rate: Segment 5 of 5

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **In-Process Fuel Use: Solid Waste: General**	
2. Source Classification Code (SCC): **3-90-012-99**	
3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **5.2**	5. Maximum Annual Rate: **45,552**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **28**	
10. Segment Comment (limit to 200 characters): **Whole tires and/or tire-derived fuel (TDF) at 14,000 Btu/lb as a supplemental fuel at up to 40% of heat input.** **40% x 364 mmBtu/hr ÷ 28 mmBtu/ton = 5.2 tons/hr**	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	016		EL
PM10	016		EL
SO2			EL
NOX			EL
CO			EL
VOC			EL
DIOX			EL
H106			NS
HAPS			NS

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information: Pollutant 1 of 7

1. Pollutant Emitted: **PM**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**32.60** lb/hour	**142.7** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **0.20 lb/ton of dry preheater feed** Reference: **BACT (DEP Permit No. PSD-FL-228)**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **163 TPH x 0.20 lb/ton = 32.60 lb/hour** **1,427,150 TPY x 0.20 lb/ton = 142.7 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**	
2. Future Effective Date of Allowable Emissions: **NA**	
3. Requested Allowable Emissions and Units: **0.20 lb/ton of dry preheater feed**	
4. Equivalent Allowable Emissions: **32.60** lb/hour	**142.7** tons/year
5. Method of Compliance (limit to 60 characters): **Method 5**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **The requested allowable emission rate represents BACT and is more stringent than NSPS/NESHAP.**	

B.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

Pollutant Detail Information: Pollutant 2 of 7

1. Pollutant Emitted: **PM10**	
2. Total Percent Efficiency of Control: %	
3. Potential Emissions: **27.71** lb/hour **121.3** tons/year	
4. Synthetically Limited? [ ] Yes [X] No	
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _______ to _______ tons/year	
6. Emission Factor: **85% of PM = 0.17 lb/ton of dry preheater feed** Reference: **AP-42 Table 11.6-5 & BACT (DEP Permit No. PSD-FL-228)**	
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5	
8. Calculation of Emissions (limit to 600 characters): **163 TPH x 0.17 lb/ton = 27.71 lb/hour** **1,427,150 TPY x 0.17 lb/ton = 121.3 tons/year**	
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):	

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**		
2. Future Effective Date of Allowable Emissions: **NA**		
3. Requested Allowable Emissions and Units: **0.17 lb/ton of dry preheater feed**		
4. Equivalent Allowable Emissions:	**27.71** lb/hour	**121.3** tons/year
5. Method of Compliance (limit to 60 characters): **Method 5 for PM**		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **The requested allowable emission rate represents BACT.**		

B.

1. Basis for Allowable Emissions Code: **NA**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

Pollutant Detail Information: **Pollutant 3 of 7**

1. Pollutant Emitted: **SO2**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**26.83** lb/hour	**117.5** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3	_______ to _______ tons/year	
6. Emission Factor: **0.28 lb/ton of clinker** Reference: **BACT (DEP Permit No. PSD-FL-228)**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **95.83 TPH x 0.28 lb/ton = 26.83 lb/hour** **839,500 TPY x 0.28 lb/ton = 117.5 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**		
2. Future Effective Date of Allowable Emissions: **NA**		
3. Requested Allowable Emissions and Units: **0.28 lb/ton of clinker**		
4. Equivalent Allowable Emissions:	**26.83** lb/hour	**117.5** tons/year
5. Method of Compliance (limit to 60 characters): **CEM**		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

B.

1. Basis for Allowable Emissions Code: **NA**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

Pollutant Detail Information: Pollutant 4 of 7

1. Pollutant Emitted: **NOX**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **268.32** lb/hour **1175.3** tons/year
4. Synthetically Limited? [ ] Yes [X] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _______ to _______ tons/year
6. Emission Factor: **2.8 lb/ton of clinker** Reference: **BACT (DEP Permit No. PSD-FL-228)**
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **95.83 TPH x 2.8 lb/ton = 268.32 lb/hour** **839,500 TPY x 2.8 lb/ton = 1175.3 tons/year**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **Permittee requests 3.8 lb/ton clinker (364.15 lb/hr & 1595.1 tons/year) during the first two years after startup.**

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**		
2. Future Effective Date of Allowable Emissions: **NA**		
3. Requested Allowable Emissions and Units: **2.8 lb/ton of clinker**		
4. Equivalent Allowable Emissions:	**268.32** lb/hour	**1175.3** tons/year
5. Method of Compliance (limit to 60 characters): **CEM**		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Permittee requests 3.8 lb/ton clinker (364.15 lb/hr & 1595.1 tons/year) during the first two years after startup.**		

B.

1. Basis for Allowable Emissions Code: **NA**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

Pollutant Detail Information: Pollutant 5 of 7

1. Pollutant Emitted: **CO**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**344.99** lb/hour	**1511.1** tons/year
4. Synthetically Limited? [ ] Yes [**X**] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **3.6 lb/ton of clinker** Reference: **BACT (DEP Permit No. PSD-FL-228)**		
7. Emissions Method Code: [**X**] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **95.83 TPH x 3.6 lb/ton = 344.99 lb/hour** **839,500 TPY x 3.6 lb/ton = 1511.1 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**	
2. Future Effective Date of Allowable Emissions: **NA**	
3. Requested Allowable Emissions and Units: **3.6 lb/ton of clinker**	
4. Equivalent Allowable Emissions: **344.99** lb/hour	**1511.1** tons/year
5. Method of Compliance (limit to 60 characters): **Method 10**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

B.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

Pollutant Detail Information: Pollutant 6 of 7

1. Pollutant Emitted: **VOC**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**11.50** lb/hour	**50.4** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **0.12 lb/ton of clinker** Reference: **BACT & AP-42, 5th Edition, Table 11.6-8**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **95.83 TPH x 0.12 lb/ton = 11.50 lb/hour** **839,500 TPY x 0.12 lb/ton = 50.4 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**		
2. Future Effective Date of Allowable Emissions: **NA**		
3. Requested Allowable Emissions and Units: **0.12 lb/ton of clinker**		
4. Equivalent Allowable Emissions:	**11.50** lb/hour	**50.4** tons/year
5. Method of Compliance (limit to 60 characters): **CEM**		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **The requested allowable emission rate represents BACT and is more stringent than NESHAP. The proposed MACT limit is 50 ppmvd as propane at 7% O_2. This equates to 49.48 lb/hr and 184.0 tons/year for this facility.** **The CEM is a requirement of the NESHAP.**		

B.

1. Basis for Allowable Emissions Code: **NA**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

Pollutant Detail Information: Pollutant 7 of 7

1. Pollutant Emitted: **DIOX**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**0.0000002** lb/hour	**0.000001** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3	_______ to _______ tons/year	
6. Emission Factor: **1.7 x 10^{-10} gr/dscf (TEQ)** Reference: **MACT: Proposed NESHAP Subpart LLL, 40 CFR 63.1343(c)(3)**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **1.7 x 10^{-10} gr/dscf x 144,000 x 60 min/hr x 1.0 lb/7000 grains = 0.0000002 lb/hr** **1.7 x 10^{-10} gr/dscf x 144,000 x 60 min/hr x 1.0 lb/7000 gr. x 8760 = 0.002 lb/year** **0.002 lb/year x 1.0 ton/2000 lb. = 0.000001 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**	
2. Future Effective Date of Allowable Emissions: **NA**	
3. Requested Allowable Emissions and Units: **1.7 x 10^{-10} gr/dscf (TEQ)**	
4. Equivalent Allowable Emissions: **0.0000002** lb/hour	**0.000001** tons/year
5. Method of Compliance (limit to 60 characters): **Method 23**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **The requested allowable emission rate represents MACT from the proposed NESHAP Subpart LLL.**	

B.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE10**			
2. Basis for Allowable Opacity:	[X] Rule **BACT**	[ ] Other	
3. Requested Allowable Opacity: Normal Conditions: **10%** Maximum Period of Excess Opacity Allowed:		Exceptional Conditions:	% min/hour
4. Method of Compliance: **COM**			
5. Visible Emissions Comment (limit to 200 characters): **This opacity limitation is more stringent than NSPS/NESHAP**			

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype: **NA**			
2. Basis for Allowable Opacity:	[ ] Rule	[ ] Other	
3. Requested Allowable Opacity: Normal Conditions: % Maximum Period of Excess Opacity Allowed:		Exceptional Conditions:	% min/hour
4. Method of Compliance:			
5. Visible Emissions Comment (limit to 200 characters):			

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor 1 of 4

1. Parameter Code: **VE**	2. Pollutant(s): **NA**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **NSPS: 40 CFR 60.63(b)** **Proposed NESHAP: 40 CFR 63.1349(a)(1)**	

Continuous Monitoring System: Continuous Monitor 2 of 4

1. Parameter Code: **EM**	2. Pollutant(s): **SO2, NOX**
3. CMS Requirement:	[ ] Rule [X] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **Required by the Department in similar recent PSD determinations.**	

Continuous Monitoring System: Continuous Monitor 3 of 4

1. Parameter Code: **EM**	2. Pollutant(s): **THC (assumed as VOC)**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **Proposed NESHAP: 40 CFR 63.1349(f)(1)**	

Continuous Monitoring System: Continuous Monitor 4 of 4

1. Parameter Code: **TEMP**	2. Pollutant(s): **NA**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **Proposed NESHAP: 40 CFR 63.1349(d)(1)**	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION (Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

[ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[**X**] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[**X**] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[**X**] C	[ ] E	[ ] Unknown
SO2	[**X**] C	[ ] E	[ ] Unknown
NO2	[**X**] C	[ ] E	[ ] Unknown
4. Baseline Emissions:			
PM		**0** lb/hour	**0** tons/year
SO2		**0** lb/hour	**0** tons/year
NO2			**0** tons/year
5. PSD Comment (limit to 200 characters):			

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements for All Applications

1. Process Flow Diagram [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
2. Fuel Analysis or Specification [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
3. Detailed Description of Control Equipment [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:_______ [ ] Not Applicable	[X] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:_______ [ ] Previously submitted, Date:______________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:_______ [X] Not Applicable	
7. Operation and Maintenance Plan [ ] Attached, Document ID:_______ [X] Not Applicable	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:_______ [X] Not Applicable	

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operation [ ] Attached, Document ID:________ [X] Not Applicable
11. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
12. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [X] Not Applicable
13. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [X] Not Applicable
14. Acid Rain Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one:

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

2. Single Process, Group of Processes, or Fugitive Only? Check one:

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

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

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

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

4. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Clinker Cooler**		
2. Emissions Unit Identification Number: [**X**] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code: **C**	4. Acid Rain Unit? [ ] Yes [**X**] No	5. Emissions Unit Major Group SIC Code: **32**
6. Emissions Unit Comment (limit to 500 characters): **This emissions unit covers the clinker cooler.**		

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **Fabric Filter – High Temperature** **Clinker Cooler Baghouse** **[An ESP is also being evaluated for the clinker cooler]**
2. Control Device or Method Code: **016**

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date: **NA**		
2. Long-term Reserve Shutdown Date: **NA**		
3. Package Unit: **NA** Manufacturer:	Model Number:	
4. Generator Nameplate Rating: **NA**	MW	
5. Incinerator Information: **NA** Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate: **NA**		mmBtu/hr
2. Maximum Incineration Rate: **NA**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **2300 tons/day of clinker**		
4. Maximum Production Rate: **NA**		
5. Operating Capacity Comment (limit to 200 characters): **NA**		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	**8760** hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

NA

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

STATE AIR REGULATIONS	
62-4, FAC	62-204, FAC
62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
FEDERAL AIR REGULATIONS	
NSPS Subpart F	Proposed NESHAP Subpart LLL

E. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **K-15 Stack**	
2. Emission Point Type Code: [**X**] 1 [ ] 2 [ ] 3 [ ] 4	
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **NA**	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **NA**	
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [**X**] V [ ] W	
6. Stack Height:	**115** feet
7. Exit Diameter:	**7.0** feet
8. Exit Temperature:	**480**°F

9. Actual Volumetric Flow Rate:	**160,000** acfm
10. Percent Water Vapor :	**2.0 – 3.0%**
11. Maximum Dry Standard Flow Rate:	**88,100** dscfm
12. Nonstack Emission Point Height: **NA**	feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters):	

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Clinker Cooler**	
2. Source Classification Code (SCC): **3-05-006-14**	
3. SCC Units: **Tons Clinker**	
4. Maximum Hourly Rate: **95.83 (24-hr avg)**	5. Maximum Annual Rate: **839,500**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **NA**	
10. Segment Comment (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	016		EL
PM10	016		EL

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information: **Pollutant 1 of 2**

1. Pollutant Emitted: **PM**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**16.30** lb/hour	**71.4** tons/year
4. Synthetically Limited? [ ] Yes [**X**] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **0.10 lb/ton of dry preheater feed** Reference: **BACT (DEP Permit No. PSD-FL-228), NSPS, Proposed NESHAP**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **163 TPH x 0.10 lb/ton = 16.30 lb/hour** **1,427,150 TPY x 0.10 lb/ton = 71.4 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **RULE**	
2. Future Effective Date of Allowable Emissions: **NA**	
3. Requested Allowable Emissions and Units: **0.10 lb/ton of dry preheater feed**	
4. Equivalent Allowable Emissions: **16.30** lb/hour	**71.4** tons/year
5. Method of Compliance (limit to 60 characters): **Method 5**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **The requested allowable emission rate represents BACT and is equal to NSPS and the proposed NESHAP.**	

B.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

Pollutant Detail Information: **Pollutant 2 of 2**

1. Pollutant Emitted: **PM10**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**13.86** lb/hour	**60.7** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **85% of PM = 0.085 lb/ton of dry preheater feed** Reference: **AP-42 Table 11.6-5 & BACT/NSPS/Proposed NESHAP**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **163 TPH x 0.085 lb/ton = 13.86 lb/hour** **1,427,150 TPY x 0.085 lb/ton = 60.7 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**
2. Future Effective Date of Allowable Emissions: **NA**
3. Requested Allowable Emissions and Units: **0.085 lb/ton of dry preheater feed**
4. Equivalent Allowable Emissions: **13.86** lb/hour **60.7** tons/year
5. Method of Compliance (limit to 60 characters): **Method 5 for PM**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **The requested allowable emission rate represents BACT.**

B.

1. Basis for Allowable Emissions Code: **NA**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hr tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE10**
2. Basis for Allowable Opacity: [X] Rule [ ] Other **40 CFR 60.62(b)(2) & Proposed 40 CFR 63.1344(a)(2)**
3. Requested Allowable Opacity: Normal Conditions: **10%** Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour
4. Method of Compliance: **COM**
5. Visible Emissions Comment (limit to 200 characters): **The requested opacity limitation represents BACT and is equal to NSPS and the proposed NESHAP.**

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype: **NA**
2. Basis for Allowable Opacity: [ ] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour
4. Method of Compliance:
5. Visible Emissions Comment (limit to 200 characters):

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: **VE**	2. Pollutant(s): **NA**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **NSPS: 40 CFR 60.63(b)** **Proposed NESHAP: 40 CFR 63.1349(b)(1)**	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code: **NA**	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION
(Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter ~~or Sulfur Dioxide~~?

   If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

   [ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [**X**] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide? **NA**

   If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

   [ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[**X**] C	[ ] E	[ ] Unknown
SO2	[ ] C	[ ] E	[ ] Unknown
NO2	[ ] C	[ ] E	[ ] Unknown

4. Baseline Emissions:		
PM	**0** lb/hour	**0** tons/year
SO2	lb/hour	tons/year
NO2		tons/year

5. PSD Comment (limit to 200 characters):

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements for All Applications

1. Process Flow Diagram [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
2. Fuel Analysis or Specification [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
3. Detailed Description of Control Equipment [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested	
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:________________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable	
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:________ [X] Not Applicable	

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operation [ ] Attached, Document ID:________ [X] Not Applicable
11. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
12. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [X] Not Applicable
13. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [X] Not Applicable
14. Acid Rain Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one:

[**X**] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

2. Single Process, Group of Processes, or Fugitive Only? Check one:

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

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

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

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

5. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Clinker & Cement Processing**		
2. Emissions Unit Identification Number: [X] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code: **C**	4. Acid Rain Unit? [ ] Yes [X] No	5. Emissions Unit Major Group SIC Code: **32**
6. Emissions Unit Comment (limit to 500 characters): **This emissions unit covers from the clinker cooler to finished cement loadout/bagging. This emissions unit is the storage, conveying and finish milling of clinker, gypsum, limestone, and other mineral aggregates into Portland and masonry cements.** **This emissions unit also covers the storage, loadout and bagging of finished cements.**		

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **Fabric Filters – High Temperature** • **L-03: Clinker cooler discharge** • **L-06: Clinker silos**
2. Control Device or Method Code: **016**

B.

1. Description (limit to 200 characters): **Fabric Filters – Medium Temperature** • **M-07: Clinker silo discharge** • **M-08: Clinker silo discharge** • **N-09: Finish mill air separator** • **N-12: Finish mill** • **N-14: Finish mill discharge**
2. Control Device or Method Code: **017**

C.

1. Description (limit to 200 characters): **Fabric Filters – Low Temperature** • **Q-25: Cement silos** • **Q-26: Cement silos** • **Q-27: Cement silos** • **Q-14: Cement loadout** • **Q-17: Cement loadout** • **Q-21: Cement loadout** • **R-15: Bagging machine**
2. Control Device or Method Code: **018**

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date: **NA**		
2. Long-term Reserve Shutdown Date: **NA**		
3. Package Unit: **NA** Manufacturer:	Model Number:	
4. Generator Nameplate Rating: **NA**	MW	
5. Incinerator Information: **NA** Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate: **NA**		mmBtu/hr
2. Maximum Incineration Rate: **NA**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **NA**		
4. Maximum Production Rate: **136 TPH cement from finish mill**		
5. Operating Capacity Comment (limit to 200 characters): **NA**		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	**8760** hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

NA

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

STATE AIR REGULATIONS	
62-4, FAC	62-204, FAC
62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
FEDERAL AIR REGULATIONS	
NSPS Subpart F	Proposed NESHAP Subpart LLL

E. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **L-03, L-06, M-07, M-08, N-09, N-12, N-14, Q-14, Q-17, Q-21, Q-25, Q-26, Q-27, R-15**
2. Emission Point Type Code: [ ] 1 [ ] 2 [X] 3 [ ] 4
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): • **L-03: Clinker cooler discharge** • **L-06: Clinker silos** • **M-07: Clinker silo discharge** • **M-08: Clinker silo discharge** • **N-09: Finish mill air separator** • **N-12: Finish mill** • **N-14: Finish mill discharge** • **Q-25: Cement silos** • **Q-26: Cement silos** • **Q-27: Cement silos** • **Q-14: Cement loadout** • **Q-17: Cement loadout** • **Q-21: Cement loadout** • **R-15: Bagging machine**
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **NA**
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [X] V [ ] W
6. Stack Height: **See Table** feet
7. Exit Diameter: **See Table** feet
8. Exit Temperature: **See Table** °F

9. Actual Volumetric Flow Rate: **See Table**	acfm
10. Percent Water Vapor : **See Table**	%
11. Maximum Dry Standard Flow Rate: **See Table**	dscfm
12. Nonstack Emission Point Height: **NA**	feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters):	

	HEIGHT FT.	DIAM. FT.	TEMP. °F	ACFM	H20	DSCFM
L-03	10	1.0	300	3,000	2%	2043
L-06	190	1.1	300	4,000	2%	2723
M-07	10	1.1	212	4,000	2%	3080
M-08	10	1.1	212	4,000	2%	3080
N-09	60	1.8	210	10,000	2%	7723
N-12	123	3.1	210	30,000	2%	23169
N-14	60	1.4	200	6,000	2%	4704
Q-25	260	2.0	150	12,000	2%	10179
Q-26	260	2.0	150	12,000	2%	10179
Q-27	260	2.0	150	12,000	2%	10179
Q-14	30	1.0	150	3,000	2%	2545
Q-17	30	1.0	150	3,000	2%	2545
Q-21	30	1.0	150	3,000	2%	2545
R-15	100	2.0	150	12,000	2%	10179
					Total =	94873

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Clinker Grinding**	
2. Source Classification Code (SCC): **3-05-006-17**	
3. SCC Units: **Tons Cement Produced**	
4. Maximum Hourly Rate: **136**	5. Maximum Annual Rate: **1,191,360**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **NA**	
10. Segment Comment (limit to 200 characters): **This segment is the storage, conveying and finish milling of clinker, gypsum, limestone, grinding aids, and other mineral aggregates into Portland and masonry cements.**	

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Cement Loadout**	
2. Source Classification Code (SCC): **3-05-006-19**	
3. SCC Units: **Tons Throughput**	
4. Maximum Hourly Rate: **500**	5. Maximum Annual Rate: **1,191,360**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **NA**	
10. Segment Comment (limit to 200 characters): **This segment is the storage, loadout and bagging of finished cements.**	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			**EL**
PM10			**NS**

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information: Pollutant 1 of 2

1. Pollutant Emitted: **PM**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **8.13** lb/hour **35.6** tons/year
4. Synthetically Limited? [ ] Yes [**X**] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _______ to _______ tons/year
6. Emission Factor: **0.01 gr/dscf** Reference: **Vendor guarantee**
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **94,873 dscfm x 0.01 gr/dscf x 60 min/hr x 1.0 lb/7000 grains = 8.13 lb/hr** **8.13 lb/hr x 8760 hr/yr x 1.0 ton/2000 lb. = 35.6 tons/year**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**
2. Future Effective Date of Allowable Emissions: **NA**
3. Requested Allowable Emissions and Units: **0.01 gr/dscf**
4. Equivalent Allowable Emissions: **8.13** lb/hour **35.6** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9 in lieu of Method 5**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

B.

1. Basis for Allowable Emissions Code: **NA**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hr tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

Pollutant Detail Information: Pollutant 2 of 2

1. Pollutant Emitted: **PM10**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**6.91** lb/hour	**30.3** tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **85% of PM** Reference: **AP-42, 5th Edition, Table 11.6-5**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **85% x 94,873 dscfm x 0.01 gr/dscf x 60 min/hr x 1.0 lb/7000 grains = 6.91 lb/hr** **6.91 lb/hr x 8760 hr/yr x 1.0 ton/2000 lb. = 30.3 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **NA**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

B.

1. Basis for Allowable Emissions Code: **NA**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE05**	
2. Basis for Allowable Opacity: [**X**] Rule **62-297.620(4), FAC**	[ ] Other
3. Requested Allowable Opacity: Normal Conditions: **5%** Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9 in lieu of Method 5**	
5. Visible Emissions Comment (limit to 200 characters):	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE10**	
2. Basis for Allowable Opacity: [**X**] Rule **40 CFR 60.62(c) & Proposed 40 CFR 63.1346**	[ ] Other
3. Requested Allowable Opacity: Normal Conditions: **10%** Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters):	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: **NA**	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: **NA**	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION
(Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter ~~or Sulfur Dioxide~~?

   If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

   [ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [X] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide? **NA**

   If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

   [ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[**X**] C	[ ] E	[ ] Unknown
SO2	[ ] C	[ ] E	[ ] Unknown
NO2	[ ] C	[ ] E	[ ] Unknown
4. Baseline Emissions:			
PM		**0** lb/hour	**0** tons/year
SO2		lb/hour	tons/year
NO2			tons/year
5. PSD Comment (limit to 200 characters):			

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements for All Applications

1. Process Flow Diagram [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
2. Fuel Analysis or Specification [ ] Attached, Document ID:________ [X] Not Applicable	[ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:________ [ ] Not Applicable	[X] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:________________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable	
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: **PSD Report**	[ ] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:________ [X] Not Applicable	

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operation [ ] Attached, Document ID:________ [X] Not Applicable
11. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
12. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [X] Not Applicable
13. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [X] Not Applicable
14. Acid Rain Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one:

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

2. Single Process, Group of Processes, or Fugitive Only? Check one:

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

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

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

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

6. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Coal Processing**		
2. Emissions Unit Identification Number: [**X**] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code: **C**	4. Acid Rain Unit? [ ] Yes [**X**] No	5. Emissions Unit Major Group SIC Code: **32**
6. Emissions Unit Comment (limit to 500 characters): **This emissions unit covers coal and petroleum coke processing from delivery through pneumatic delivery to burners.**		

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **Fabric Filters – Low Temperature** • **S-17: Coal mill** • **S-21: Coal bin**
2. Control Device or Method Code: **018**

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date: **NA**		
2. Long-term Reserve Shutdown Date: **NA**		
3. Package Unit: **NA** Manufacturer:	Model Number:	
4. Generator Nameplate Rating: **NA**	MW	
5. Incinerator Information: **NA** Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		°F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate: **NA**		mmBtu/hr
2. Maximum Incineration Rate: **NA**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **NA**		
4. Maximum Production Rate: **14.6 TPH pulverized coal**		
5. Operating Capacity Comment (limit to 200 characters): **NA**		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	**8760** hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

NA

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

STATE AIR REGULATIONS	
62-4, FAC	**62-204, FAC**
62-210, FAC	**62-212, FAC**
62-213, FAC	**62-296, FAC**
62-297, FAC	
FEDERAL AIR REGULATIONS	
NSPS Subpart Y	

E. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **S-17, S-21**
2. Emission Point Type Code: [ ] 1 [ ] 2 [X] 3 [ ] 4
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): • **S-17: Coal mill** • **S-21: Coal bin**
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **NA**
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [X] V [ ] W
6. Stack Height: **See Table** feet
7. Exit Diameter: **See Table** feet
8. Exit Temperature: **See Table** °F

9. Actual Volumetric Flow Rate: **See Table**	acfm
10. Percent Water Vapor : **See Table**	%
11. Maximum Dry Standard Flow Rate: **See Table**	dscfm
12. Nonstack Emission Point Height: **NA**	feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters):	

	HEIGHT FT.	DIAM. FT.	TEMP. °F	ACFM	H20	DSCFM
S-17	50	2.4	150	18,000	6.5%	14568
S-21	60	1.0	150	3,000	2%	2545
					Total =	**17,112**

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Mineral Products: Coal Cleaning: Material Handling: Crushing**	
2. Source Classification Code (SCC): **3-05-010-10**	
3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **14.6**	5. Maximum Annual Rate: **127,896**
6. Estimated Annual Activity Factor: **NA**	
7. Maximum Percent Sulfur: **NA**	8. Maximum Percent Ash: **NA**
9. Million Btu per SCC Unit: **NA**	
10. Segment Comment (limit to 200 characters): **Crushing of coal and petroleum coke.**	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
PM10			NS

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information: Pollutant 1 of 2

1. Pollutant Emitted: **PM**

2. Total Percent Efficiency of Control: %

3. Potential Emissions: **1.47** lb/hour **6.4** tons/year

4. Synthetically Limited?
   [ ] Yes [X] No

5. Range of Estimated Fugitive/Other Emissions:
   [ ] 1 [ ] 2 [ ] 3 _______ to _______ tons/year

6. Emission Factor: **0.01 gr/dscf**
   Reference: **Vendor guarantee**

7. Emissions Method Code:
   [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

8. Calculation of Emissions (limit to 600 characters):

17,112 dscfm x 0.01 gr/dscf x 60 min/hr x 1.0 lb/7000 grains = 1.47 lb/hr

1.47 lb/hr x 8760 hr/yr x 1.0 ton/2000 lb. = 6.4 tons/year

9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **BACT**	
2. Future Effective Date of Allowable Emissions: **NA**	
3. Requested Allowable Emissions and Units: **0.01 gr/dscf**	
4. Equivalent Allowable Emissions: **1.47** lb/hour	**6.4** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9 in lieu of Method 5**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **The requested grain loading represents BACT and is more stringent than NSPS Subpart Y.**	

B.

1. Basis for Allowable Emissions Code: **NA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

Pollutant Detail Information: Pollutant 2 of 2

1. Pollutant Emitted: **PM10**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**1.47** lb/hour	**6.4** tons/year
4. Synthetically Limited? [ ] Yes [**X**] No		
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _______ to _______ tons/year		
6. Emission Factor: **0.01 gr/dscf: PM10 assumed equal to PM** Reference: **Vendor guarantee**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **17,112 dscfm x 0.01 gr/dscf x 60 min/hr x 1.0 lb/7000 grains = 1.47 lb/hr** **1.47 lb/hr x 8760 hr/yr x 1.0 ton/2000 lb. = 6.4 tons/year**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **NA**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

B.

1. Basis for Allowable Emissions Code: **NA**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE05**	
2. Basis for Allowable Opacity: [X] Rule **62-297.620(4), FAC**	[ ] Other
3. Requested Allowable Opacity: Normal Conditions: **5%** Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9 in lieu of Method 5**	
5. Visible Emissions Comment (limit to 200 characters): **This opacity limitation applies to the coal mill.**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE20**	
2. Basis for Allowable Opacity: [X] Rule **40 CFR 60.252(a) & (c) and 62-296.320, FAC**	[ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20%** Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **This opacity limitation applies to coal processing and conveying equipment, coal storage system, and coal transfer and loading system.** **This limitation also applies when processing petroleum coke.**	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: **TEMP**	2. Pollutant(s): **NA**
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **40 CFR 60.253(a)(1)**	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: **NA**	2. Pollutant(s):
3. CMS Requirement: [ ] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION (Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter ~~or Sulfur Dioxide~~?

If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

[ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[X] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide? **NA**

   If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

   [ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[**X**] C	[ ] E	[ ] Unknown
SO2	[ ] C	[ ] E	[ ] Unknown
NO2	[ ] C	[ ] E	[ ] Unknown
4. Baseline Emissions:			
PM		**0** lb/hour	**0** tons/year
SO2		lb/hour	tons/year
NO2			tons/year
5. PSD Comment (limit to 200 characters):			

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements for All Applications

1. Process Flow Diagram [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
2. Fuel Analysis or Specification [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
3. Detailed Description of Control Equipment [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested	
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable	
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: **PSD Report** [ ] Not Applicable	
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:________ [X] Not Applicable	

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operation [ ] Attached, Document ID:________ [X] Not Applicable
11. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
12. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [X] Not Applicable
13. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [X] Not Applicable
14. Acid Rain Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [X] Not Applicable

1210465-001-AC

Rec'd 11/30/98

SUWANNEE AMERICAN CEMENT CO., INC.
P. O. Box 410
Branford, FL 32008

63-551/631

DATE 11/19/98

PAY TO THE ORDER OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION $7,500.00

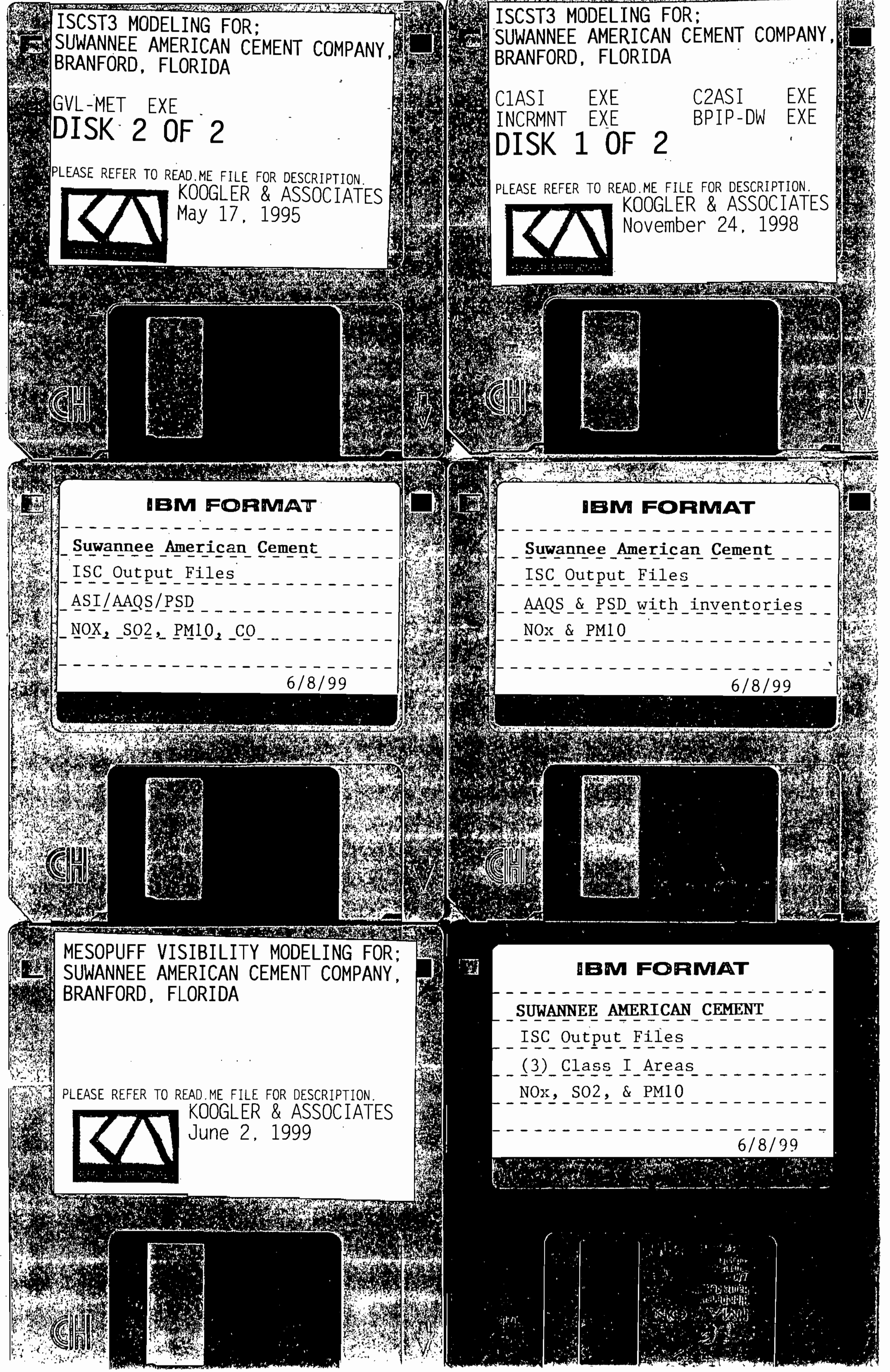
*****SEVEN THOUSAND FIVE HUNDRED & NO/100***** DOLLARS

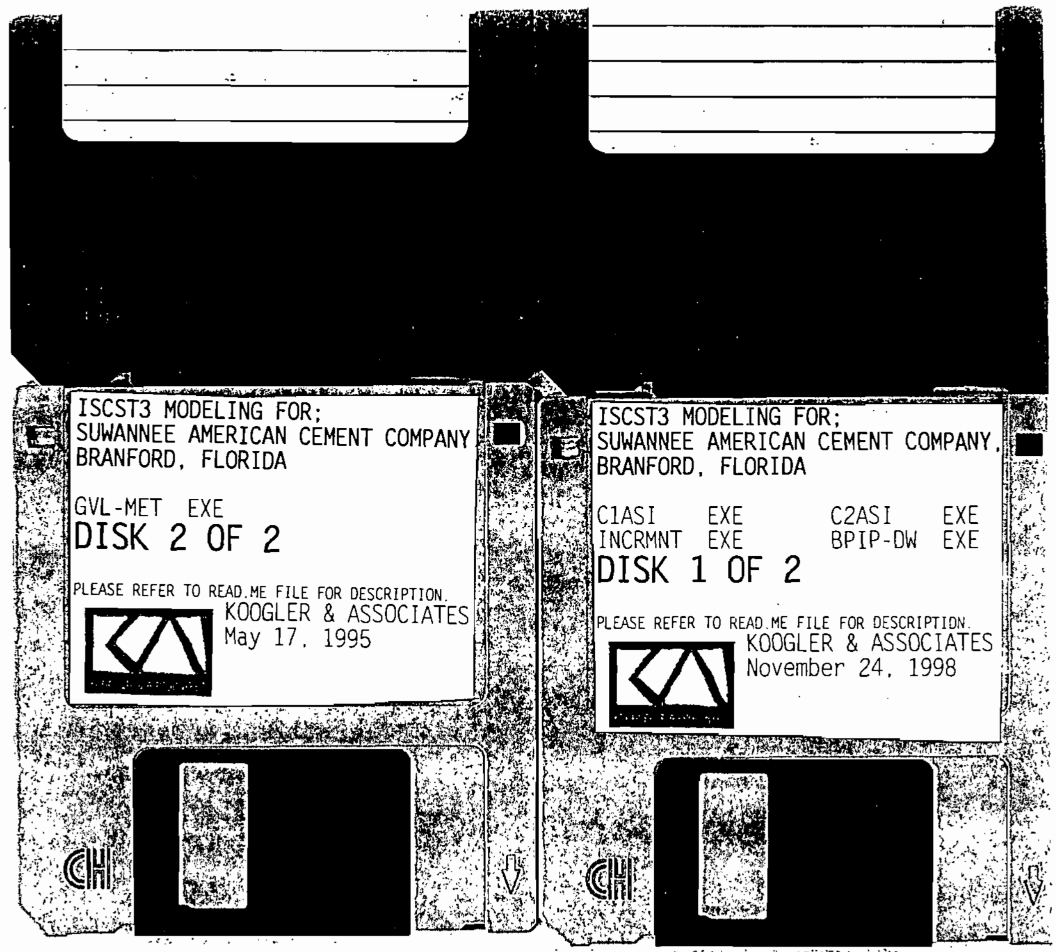
Lafayette County State Bank
Mayo • Branford
Florida
Independently Owned & Operated

FOR Application Fee

MP

[redacted]


ISCST3 MODELING FOR;
SUWANNEE AMERICAN CEMENT COMPANY,
BRANFORD, FLORIDA
GVL-MET EXE
DISK 2 OF 2
PLEASE REFER TO READ.ME FILE FOR DESCRIPTION.
KOOGLER & ASSOCIATES
May 17, 1995
ISCST3 MODELING FOR;
SUWANNEE AMERICAN CEMENT COMPANY,
BRANFORD, FLORIDA
C1ASI EXE
INCRMNT EXE
C2ASI EXE
BPIP-DW EXE
DISK 1 OF 2
PLEASE REFER TO READ.ME FILE FOR DESCRIPTION.
KOOGLER & ASSOCIATES
November 24, 1998
IBM FORMAT
Suwannee American Cement
ISC Output Files
ASI/AAQS/PSD
NOX, SO2, PM10, CO
6/8/99
IBM FORMAT
Suwannee American Cement
ISC Output Files
AAQS & PSD with inventories
NOx & PM10
6/8/99
MESOPUFF VISIBILITY MODELING FOR;
SUWANNEE AMERICAN CEMENT COMPANY,
BRANFORD, FLORIDA
PLEASE REFER TO READ.ME FILE FOR DESCRIPTION.
KOOGLER & ASSOCIATES
June 2, 1999
IBM FORMAT
SUWANNEE AMERICAN CEMENT
ISC Output Files
(3) Class I Areas
NOx, SO2, & PM10
6/8/99


ISCST3 MODELING FOR;
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C1ASI EXE C2ASI EXE
INCRMNT EXE BPIP-DW EXE
DISK 1 OF 2
PLEASE REFER TO READ.ME FILE FOR DESCRIPTION.
KOOGLER & ASSOCIATES
November 24, 1998