RTP ENVIRONMENTAL ASSOCIATES, INC.®
AIR • WATER • SOLID WASTE CONSULTANTS
239 U.S. Highway 22 East
Green Brook, New Jersey 08812-1909
(www.rtpenv.com)
(732) 968-9600
Fax: (732) 968-9603

RECEIVED
MAR 07 2005
BUREAU OF AIR REGULATION

March 3, 2005

James K. Pennington, P.E.
Administrator, North Permitting Section
Division of Air Resource Management
Department of Environmental Protection
2600 Blair Stone Road, MS #5505
Tallahassee, Florida 32399-2400

Re: Response to Request for Additional Information Dated January 19, 2005
DEP File No. 0530021-009-AC (PSD-FL-351)
Proposed New Kiln (Cement Plant #2) at the Florida Crushed Stone Brooksville Facility , Hernando County, Florida

Dear Mr. Pennington:

Florida Crushed Stone Company (FCS) received the Department's request for additional information dated January 19, 2005. This letter and its attachments contain our responses. When any revisions necessitate changes to the permit application text or forms, we have included the revised pages in Attachment A for replacement in the original application. We are also submitting a revised modeling CD-ROM. For ease of reading, each of the Department's requests is presented in italics first, with our responses following.

1. *Provide manufacturer's certification that will confirm the maximum design capacity of the kiln in tons per hour of dry feed and in tons per hour of clinker produced. Provide a similar certification for heat input for the kiln and precalciner burners. Rule 62-4.070, F.A.C.*

FCS Response: Please see the attached letters from Polysius Corp. included as Attachment B, which contain the requested certifications.

2. *Provide details on the kiln burner and describe where air and fuel will be introduced and how they are staged to minimize NO_X formation. Please indicate the type of burner that will be used. Explain why the flue gas needs reheating for use with an SCR system. Rules 62-212.400 and 62-4.070(1), F.A.C.*

FCS Response: Please refer to Section 4.5.2 of our original application for details on the kiln burner and staged combustion. Additional information follows.

Low NO_x burners are multi-channeled burners. Typically fuel (oil, pulverized coal, or pulverized petroleum coke) is fired with minimal combustion air through a central channel. The pressure of the primary air is controlled to obtain optimum exit momentum and ignition distance. Additional primary air is introduced and controlled through one or more additional channels to produce a fuel rich combustion zone in which the initial fuel combustion occurs.

Because of the fuel-rich characteristics of this zone (i.e., low oxygen), thermal NO_x formation is minimized. The amount and pressure of the primary air controls the flame shape and flame intensity as required for desired heat and flame shape distribution in the kiln. Secondary air from the clinker cooler is introduced downstream to provide sufficient oxygen for the complete burn-out of the fuel.

The staging of the primary and secondary combustion air and the total amount of combustion air controls thermal NO_x formation. To minimize thermal NO_x emissions, cement kilns are typically operated with 1-2 percent oxygen in the gases leaving the kiln. With add-on NO_x control technology such as Selective Noncatalytic Reduction (SNCR), the oxygen in the gases leaving the kiln can be increased to 3-4 percent. This has a tendency to improve kiln stability and reduce material build up in the riser duct and in the calciner.

In SCR, the flue gas requires reheating in order to bring the gas temperature into the effective range of the catalyst. The only Selective Catalytic Reduction (SCR) system at a cement kiln in the world was set up as a "hot side" unit to avoid the reheat costs. Based on best available information, it has achieved only approximately 40% availability. Catalyst vendors have been reluctant to even provide quotes for a "cold side" SCR system for a cement kiln. They have indicated that a "hot side" unit could not be quoted without site specific studies. The record for the LAER determination for St. Lawrence Cement in New York has reinforced this conclusion.

3. *Describe the manner in which the precalciner vessel(s) will operate at the facility. Rules 62-212.400 and 62-4.070(1), F.A.C.*

FCS Response: Please refer to Section 4.5.2 of our original application for details on the precalciner operation. The following additional information is provided for clarity.

The high carbon flyash (up to 50 percent or more carbon) will be introduced directly into the combustion chamber. In the combustion chamber, the carbon content of the flyash will burn, increasing the thermal efficiency of the kiln system. The mineral content will exit with the combustion gases, combine with the raw meal from the preheater, and become a part of the clinkering minerals introduced to the kiln.

The multi-stage combustion process of the Polysius kiln controls the oxidizing and reducing conditions over the entire length of the calciner. Multi-stage combustion will be accomplished by staging combustion air rather than by staging fuel, except in the case when whole tire-derived fuel is used. Due to the ability to create reducing and oxidizing conditions in any given area of the calciner vessel (duct), a kiln inlet burner will not be required. The proposed plant will burn tires introduced into the kiln inlet area, which will reduce the amount of fuel fired in the combustion chamber. Tire-derived fuel, when used, will provide up to 15 percent of the heat input to the pyroprocessing system. The firing of tire-derived fuel will reduce the oxygen content of the gas stream leaving the kiln and entering the calciner, which will have the tendency to reduce NO_x formed in the kiln. Tire-derived fuel results in the staging of fuel, as well as the staging of air, in the Polysius multi-stage combustion design.

4. *Please provide information on CO and VOC control options, and details of both why CO and VOC will require a higher emission limit than has currently been permitted. 62-4.070(1), F.A.C.*

FCS Response: Please refer to Sections 4.6 and 4.7 of our original application for details on CO and VOC control options, respectively. Regarding the control of carbon monoxide emissions, the Polysius design provides the necessary residence time and turbulence following the introduction of combustion air into the calciner and prior to the bottom stage cyclone of the preheater (Stage 1) to assure burnout of the carbon monoxide formed in the pyroprocessing system (kiln and calciner). Ammonia for use with the SNCR system proposed for NO_x control is injected into this same section of the calciner. To reiterate, the CO and VOC rates for Kiln 2 are higher because of the use of SNCR to control NO_x emissions. SNCR (ammonia injection) will result in competing reactions between the reduction of NO_x and the oxidation of carbon monoxide.

Also, high Loss on Ignition (LOI) fly ash can contain significant organic carbon. To assure that the use of high carbon flyash does not cause CO (or hydrocarbon) emission problems, FCS is requesting the option of introducing the high carbon flyash directly into the combustion chamber of the calciner to assure the efficient combustion of this carbon and the oxidation of any resulting CO by the introduction of combustion air downstream of the combustion chamber.

5. *Please provide information justifying a proposed limit of 0.2lb/ton for both PM and PM_{10}. 62-4.070(1), F.A.C.*

FCS Response: The proposed limit for PM_{10} is the same as the proposed limit for PM because the applicant has conservatively assumed that all particulate emissions from the stack will be PM_{10}.

6. *Please assess the use of "high-efficiency bag filter, outfitted with teflon-coated fiberglass bags" and/or HEPA filters as secondary controls of particulate matter from the kiln system. What percentage, if any, of the collected fines will be recycled into the process? Rule 62-212.400, F.A.C.*

FCS Response: Please refer to Section 4.3 of our original application (page 4-8 to 4-9) for the assessment of enhanced bag fabrics. One hundred percent of the collected fines are recycled into the process.

7. *Submit a projected chemical analysis of the raw materials and additives likely to be used at this plant. Provide a proximate and ultimate analysis of the fuels proposed. Rule 62-4.070(1), F.A.C*

FCS Response: Attachment C contains the chemical analysis of raw materials and additives currently in use at the FCS cement plant. Proposed raw materials and additives for the new kiln include, but are not limited to, the materials analyzed. Note that these analyses should not be taken as limitations on suitable raw materials and additives for use at the FCS facility.

Fuel data was presented in Attachment 2 of our original application. For clarity some additional data are presented in Attachment C.

8. *Please indicate if you intend to add any storage tanks meeting the applicability requirements under 40 CFR 60, Subpart Kb. Rule 62-4.070(1), F.A.C.*

FCS Response: No. Rinker proposes two tanks. The proposed 10,000 gallon fuel oil tank is exempt from 40 CFR 60, Subpart Kb because it is less than 19,813 gallon capacity. The proposed storage of aqueous ammonia (24 tons per truck load, approximately 5,600 gallons) is not covered by Subpart Kb because ammonia is not an organic compound. Most likely, the storage tank for aqueous ammonia will have a 10,000 gallon capacity.

9. *Describe the primary fuel firing scenarios and describe the ratio of heat input at various fuel mixtures. Detail why heat input ratios might change under normal operating conditions and emissions. Provide an estimate of pollutant emissions under each scenario. Define the combustion practices that will be used to control CO and VOC. Rule 62-4.070(1), F.A.C.*

FCS Response: Under normal conditions, the fuel fired through the kiln burner will be pulverized bituminous coal or a mixture of coal and petroleum coke. The fuel fired to the calciner will typically be pulverized coal, pulverized petroleum coke, or a mixture of the two. Optional fuels will include natural gas, fuel oil, tire-derived fuel, and (if considered a fuel) fly ash. These fuels may be fired alone or in combination.

Generally the heat released in the kiln and calciner is determined by the feed rate to the calciner and the burnability of the raw materials. The feed rate is dependent upon the design of the kiln system, and increases in the feed rate will require an increase in the heat input to the pyroprocessing system. Burnability is dependent upon the chemistry of the materials mined on site, off site raw materials, and the fineness to which the raw materials are ground in the raw mill. Hard-to-burn raw materials will require an increase in the heat input.

Depending on the physical and chemical properties of the secondary fuel like petroleum coke, it is necessary to maintain the level of the sulfur, heating value, and ash content and the total heat released in the kiln and calciner. In addition, the variation of the raw material and fuel chemistry will require control and variation of the input of fuel. In general the ratio of the heat input between the kiln and calciner is about 50/50%.

Changes in the heat input ratios and/or the types of fuel used could result from changes in the chemistry of raw materials, changes in fuel characteristics, the availability of fuels, and the necessity to maintain a stable operating kiln. Under so called "normal" or "stable" operating conditions it is very possible that kiln feed could change in terms of the physical properties, fineness, or chemistry. These might require changing a fuel rate, feed rate, or other parameters. The same situation could occur with fuel quality. These situations can lead to upset conditions, during this time the operator must do a series of adjustments. The adjustments of the fuel, air control, kiln feed properties, kiln feed rate, and the thermal profile in the system restore the desired conditions. Changes in heat input ratios and/or in fuels fired to the pyroprocessing system are not expected to have significant effects on emissions from the kiln system.

Please refer to Sections 4.6 and 4.7 of our original application for a discussion of the combustion practices to reduce CO and VOC.

10. *Part D [Segment (Process/Fuel) Information] of Section 1 in the application indicates only three segments. However in Section 4.0 of the BACT Determination, other fuels are listed as fuels for the kiln and pre-calciner. Provide a list all fuels the facility intends to use for*

the kiln, pre-calciner and all other emissions units. Explain in what combinations or maximum amounts/percentages these fuels will be used. Explain how the different fuel types/combinations may affect emission rates, operation of control equipment (fabric filter (PM/PM_{10}) and SNCR (NO_x)) and affect control of combustion in the kiln (as Good Combustion Practice is the proposed BACT technology for CO and VOC, and Multistage Combustion is a component of the BACT for NOx). Rule 62-4.070(1), F.A.C.

FCS Response:
Part D [Segment (Process/Fuel) Information] of Section 1 requires that all proposed fuels be listed. The list of fuels was presented in Attachment 2 of Volume II (PSD application), and the form has now been updated to include the following fuels:
Natural Gas
Distillate Oil
Coal
Propane
Petroleum Coke (20% of total heat input)
Tires (15% of total heat input)
High Carbon Fly Ash
On-spec oil

The Kiln II System is designed to use a combination of fuels. The primary fuels for the kiln and pre-calciner are coal and petroleum coke since the system is most efficient using these fuels. Maximum tire heat input will be 15% of the total. The maximum petroleum coke input will be 20% of the total heat input. Other fuels will most likely be used only in the event of coal/coke supply problems.
The processing equipment that is typically installed in a modern cement plant is very flexible when it comes to the fuels. Therefore, changes in fuels fired to the pyroprocessing system are not expected to have significant effects on emission limits for the kiln system. See also Response 9 above.

11. *Please explain the SO_2 emissions limit of 0.23 lb/hr. Provide information on the increase of SO_2 by co-firing different fuels with the coal in the kiln, and how this will effect your BACT determination for SO_2. Consider the possibility of hydrated lime injection for added SO_2 control when the raw mill is off, or raw material with higher sulfur is encountered, or if excess SO_2 from burning high sulfur fuel causes a break through in the calciner. Rule 62-4.070(1), F.A.C.*

FCS Response: The stated SO_2 emissions limit, 0.23 lb/ton clinker, is the cement plant vendor's (Polysius) performance warranty, taking into account the anticipated range of fuel properties and process conditions. It also accounts for the expected periodic downtime of the raw mill, which acts as a dry contactor and provides modest SO_2 control.

Because there is a substantial amount of alkaline material in the process, the SO_2 emissions are normally more strongly influenced by the properties of the raw material (including the presence of pyrites and organic sulfur compounds), than by sulfur content in the fuel. The vendor has expressed confidence in the facility's ability to maintain the guaranteed emission limit.

In general, the higher the sulfur input to the pyroprocessing system, the higher the potential will be for plugging in the pre-calcining tower. Hypothetically, if higher sulfur fuels were purchased, sulfur compounds will accumulate in the system and lead to blockages and plugging. Therefore, the plant's operators have an incentive to limit the use of higher sulfur fuels and maintain production capacity. The low sulfur levels in the raw materials of the FCS Brooksville site will allow for significant variability in the percentages of sulfur in the fuels as long as the sulfur/alkali balance is achieved. The appropriate amounts and proportions of fuels, with their various sulfur contents, will be determined by the facility's operators as part of their efforts to maintain operational stability and chemical balance in the system.

For example, the kiln can be operated with 100% replacement of solid fuels with natural gas. However, the production rate will fall due to the quantities of combustion products generated by combustion of natural gas. In general, the production rate will fall by about 20% with this scenario. Conversely, the owners may have an economic incentive to burn petroleum coke, but for operational reasons and to maintain compliance, the extensive use of this fuel will be limited.

The use of hydrated lime for SO_2 control has been demonstrated to be technically effective. Suwannee American Cement conducted tests in 2004 and reported to the Department that the introduction of hydrated lime into the preheater feed was effective for reducing SO_2 emissions. Also, F. L. Smidth has reported similar results (*Emissions Audit During Hydrated Lime Addition Trials*, St. Mary Cement Company, Bowmanville, Ontario, Canada, August 10-12, 2004) with the introduction of hydrated lime into the preheater feed.

In our response to Question 16 (below) we have included a new economic analysis for two dry hydrated lime injection options, and two other flue gas desulfurization options. The analysis indicates that none of these processes is cost-effective as BACT.

12. Provide the volume and residence time of material in the calciner with the production rate of 125 tons per hour for the new kiln. Rule 62-4.070(1), F.A.C.

FCS Response: The planned volume of the calciner is estimated to be 326 cubic meters (approximately 11,500 cubic feet). This volume includes the combustion chamber (68 cubic meters) and 258 cubic meters between the combustion chamber and the Stage 1 (bottom) preheater cyclone.

The hot raw meal from the Stage 2 cyclone will be split and introduced tangentially with the combustion air entering the combustion chamber. The tangential inlets are at 180 degrees to one another. The material residence time in the calciner loop will be approximately 4.5 seconds at a clinker production rate of 125 tons per hour. The addition of the separate combustion chamber increases the retention time for the burning fuel by 0.4 seconds compared to a system without a combustion chamber.

13. For NO_x, SO_2, and CO, please justify the significantly higher emission rates for startup, shutdown, and non routine activities. Rule 62-4.070(1), F.A.C.

FCS Response: Please refer to Section 3.1.2 of our original application under the heading "Start-up and Non-routine (Malfunction) Operating Conditions" for details on NO_x emission rates, as well as Sections 3.1.3 and 3.1.4 for SO_2 and CO emission rates, respectively.

The term "startup" and "shutdown" refer to conditions characterized by operation with significantly low (not up to nominal) production rate. During start up of the kiln, the operating parameters of the system are changing continuously. The system requires additional specific heat consumption under elevated oxygen levels. The heat recuperation from the fuel to material is poor therefore the entire thermal profile is shifted. The system is not accumulating sufficient thermal capacity to sustain the burning process. The burning of the fuel is not efficient and overall the efficiency of the system is significantly lower than compared to the stable nominal production rate. Under startup conditions, the Clinker Cooler does not have sufficient hot clinker to recuperate the heat for secondary and tertiary air. The system's main parameters are not in equilibrium until the production level stabilizes. The same conditions occur during malfunctions and shutdown. That is why under these conditions the emissions levels for SO_2, NOx, CO, and VOC will be elevated.

The procedures of the existing Startup, Shutdown, and Malfunction Plan provide details for the various modes of operation. This plan is provided as Attachment D. Because nearly all opacity excursions from the kiln/roller-mill stack occur as a result of startups, shutdowns, and malfunctions of the roller mill or baghouse, actions to minimize excess opacities include adjustments to the operation of the gas-conditioning tower, verifying exhaust-gas damper positions, minimizing the draft through the roller mill, and reducing or stopping feed flows.

14. *Estimate the impact of mercury deposition in the vicinity of this facility. Please provide reasonable assurance that the 26 lb/year of mercury emissions will not be exceeded. Also, provide reasonable assurance that the lead PSD significance levels will not be exceeded. Advise of any methods that will be undertaken to minimize mercury emissions such as raw material selection or transferring some baghouse dust straight to product. Rule 62-4.070(1), F.A.C.*

FCS Response: The procedures used to estimate the deposition of mercury in the vicinity of the facility were based on the procedures described in Chapter 4.3 of "Mercury Study Report To Congress Volume III: Fate And Transport Of Mercury In The Environment," EPA-452/R-97-005, December, 1997 (herein referred to as the EPA Mercury Report). The form of mercury that is deposited close to the emission source is divalent mercury or Hg(II), therefore this form of mercury was considered in the air dispersion modeling. At the point of stack emissions and during atmospheric transport, Hg(II) is partitioned between vapor and particle phases, and each of these phases can be removed from the atmosphere by both wet and dry deposition processes. For the present analysis, the speciation of emitted divalent mercury was based on data in the EPA Mercury Report for Portland cement manufacturing, with 10% of total mercury emissions assigned to each of the vapor and particle Hg(II) phases. Wet and dry deposition of particle and vapor Hg(II) was then modeled using the ISCST3 model.

For dry deposition of particulate Hg(II), the ISCST3 dry deposition option was used. This option requires data on particle size distribution and density. This data was based on the EPA Mercury Report data, which estimated that approximately 93% and 7% of the total surface area is estimated to be in the 0.3 and 5.7 micron diameter particles, respectively. The particle density value used is 1.8 gr/cm^3.

For dry deposition of vapor Hg(II), the ISCST3 gas deposition option was used. In the EPA Mercury Report and in this analysis, the dry deposition velocity for nitric acid vapor of 2.9 cm/sec was used as a surrogate for Hg vapor based on their similar solubilities in water.

For wet deposition of vapor and particulate Hg(II), the ISCST3 wet deposition option was used. The same data on particle size distribution and particle density was used as in the dry particle deposition runs. For particles, the wet deposition scavenging ratios used were from Figure 4-4 in the EPA Mercury Report (0.8E-4 sec/mm/hr for the 0.3 micron size range and 3.8E-4 sec/mm/hr for the 5.7 micron size range). For vapor phase Hg(II) deposition, a scavenging coefficient of 1.6E-6 sec/mm/hr was also used (based on the nitric acid scavenging ratio as described in the EPA Mercury Report).

Four separate ISCST3 runs were performed, one each for each phase of Hg(II) and for each deposition type, and the results from all four runs were summed to calculate total mercury deposition. Based on the maximum proposed stack emissions of 150 pounds per year of mercury for the new kiln, the estimated average annual total deposition (wet and dry) from Hg(II) particles and vapor at the facility boundary is 6.1 $\mu g/m^2$. This rate can be compared to estimates of the annual background deposition rate at the nearest Mercury Deposition Network monitoring site (site ID FL05 at the Chassahowitzka National Wildlife Refuge) of approximately 20 $\mu g/m^2$. The total deposition of mercury resulting from emissions of the new kiln is approximately 30% of the existing mercury deposition rate in the area, which should be insignificant.

The following information provides reasonable assurance that the mercury emissions and the lead PSD significance emission level will not be exceeded. The mercury emission rates on the forms have been revised from 26 lb/yr to 150 lb/yr, and are based on actual Hg stack test results from the current Brooksville kiln during the period 1990 through 1992[1]. Therefore, these emission rates take into consideration the same feed material and fuels from long-term suppliers that will be used for the proposed new kiln. Based on a review of stack test data from other similar Portland cement kilns and based on best engineering judgement, the lead emissions have been revised from 76 lb/yr to 750 lb/yr (equivalent to $7.34*10^{-4}$ pounds per ton of clinker). Using this factor for the proposed plant, lead emissions are far below the significance level for lead of 1200 pounds per year.

The concept of transferring baghouse dust directly to finished cement would have an affect on cement quality. Because of this, the concept is of limited use until ASTM and/or DOT change their specification limits.

15. Part D [Segment (Process/Fuel) Information] of Section 1 in the application indicates the kiln will have a maximum of 6 startups lasting 12 hours per year. However, throughout the application and in the BACT Determination, startup/shutdown and non routine emissions estimates vary based on 4 events each month lasting 7 hours for a total of 28 hours a month. Please explain the discrepancy. Explain the NO_x, SO_2, and CO calculations used for startup, shutdown and non routine emissions. The application states 750 hours for these periods, but the calculations are based on the 28 hours a month (336 hours/year). Explain the discrepancy. How many startup and shutdown events will normally occur each year? Describe the nature and duration of emissions, particularly from the in-line kiln/raw

[1] Conversation between Mike Vardeman of Rinker and John Koogler of Koogler Assoc, 12/14/04.

mill and clinker cooler, during startup and shutdown. Describe procedures used to minimize excess emissions during these events. Rules 62-4.070(1) and 62-210.700, F.A.C.

FCS Response: The estimate of 336 hours/year of startup, shutdown, and non routine operations is correct. The application forms and emission calculations relating to startup, shutdown, and non routine operations have been corrected and are included in Attachment A.

Regarding the nature of emissions during startup and shutdown, please refer to the response for Question 13 above. Startup conditions can last for several hours (ranging anywhere from 7 to more than 24 hours), while in contrast, shutdown conditions take a relatively short time.

In order to minimize emissions during startup conditions (and to operate the facility in a cost effective manner), the duration of the startup will be maintained as short as possible. The plant personnel emphasize scheduling of the heating up of the kiln as quickly as possible to bring the kiln to nominal capacity. As referenced in the response to Question 13, the procedures of the existing Startup, Shutdown, and Malfunction Plan provide details for the various modes of operation (see Attachment D).

16. *Provide additional BACT incremental control and economic analysis for controlling SO_2, PM, and CO. Explain cost savings and analysis between different types of controls and the level of each of the controls for these pollutants. Rule 62-4.070, F.A.C.*

FCS Response: Average cost-effectiveness and incremental costs were provided for all PSD pollutants in Table 4-4 of our original application. Incremental costs are only calculated when there are several pollution controls being considered. For PM, the top control option was selected (baghouse), so providing additional costs analyses would not provide any useful information. For CO, the only potential control for a cement plant above the baseline (combustion controls) is an add-on RTO and costs are provided for this option. Thus, average and incremental costs are the same.

For SO_2, we have included revised cost analysis tables in Attachment A. The revised Table 4-4 summarizes these new calculations. Tables C-3, C-4, C-5 and C-6 (to add to Appendix C of the original application) are new cost-effectiveness calculations for the following flue gas desulfurization technologies:

1. hydrated lime injection in the proposed Preheater Tower,
2. hydrated lime injection in a separate vendor-supplied dry injection tower,
3. semi-dry (spray dryer absorption with milk of lime slurry), and
4. limestone wet scrubbing.

As suggested by FDEP (Question 11 above), the dry hydrated lime [$Ca(OH)_2$] injection technologies (Options 1 and 2) were considered herein for the purpose of controlling SO_2 when the raw mill is out service. The experience at Suwannee American and St. Mary Cement indicates that Technology 1 is technically feasible; however, absent sufficient generally available performance data, vendors are not yet prepared to offer performance warranties for this option. Suwannee Cement uses hydrated lime injection only if raw meal is off-specification with respect to available alkali for SO_2 absorption. In that circumstance, SO_2 control efficiency attributed to hydrated lime injection is 30-40%.[2] For informational

[2] J. L. Gaines (RTP) telephone conversations with O. Geskin (Polysius), February, 2005.

purposes, we have enclosed a cost analysis for Technology 1, based on an estimated control efficiency of 45% in the raw mill when operating, and 35% control efficiency for dry lime injection in the Preheater Tower (with raw mill out of service).

One vendor has expressed a willingness to offer an emission control efficiency guarantee[3] for Technology 2; therefore, we have also included a cost analysis for this option. Tables C-3 and C-4 each include separate columns showing expected performance parameters under two operating scenarios (with and without the raw mill in service), along with columns comparing long-term average emissions (accounting for raw mill down-time) with and without the respective flue gas desulfurization systems installed. At $22,726/ton and $21,933/ton SO_2 removed, respectively (Tables C-3 and C-4), Technologies 1 and 2 are not cost-effective as BACT.

The semi-dry process (Technology 3) consists of a spray dryer absorber (SDA) system upstream of the proposed baghouse, including storage and slaking of quicklime (CaO) to generate "milk of lime" (aqueous hydrated lime slurry). In this process, lime slurry is spray dried in the SDA, where it absorbs SO_2 and generates calcium sulfate/sulfite reaction products. Suspended particulate matter and spray-dried reaction products are collected in the proposed fabric filter. It is not clear whether this technology is feasible for the proposed cement plant, because we did not evaluate whether the flue gas (200-250 °F at SDA inlet) contains sufficient heat to vaporize and spray dry the quantity of lime slurry required to achieve effective SO_2 absorption. Evaporative cooling of the flue gas will increase the likelihood of a steam plume under some atmospheric conditions, and will also adversely affect modeled ambient concentrations of criteria pollutants. Table C-5 demonstrates that Technology 3 is not cost-effective as BACT ($19,657/ton SO_2 removed).

Table C-6 shows capital and operating costs for Technology 4, wet limestone flue gas desulfurization (wet FGD). The wet FGD system would be installed downstream of the proposed baghouse system. We have not clearly established the feasibility of this technology, since (a) the wet scrubber would create a dense steam plume, and (b) the evaporatively-cooled flue gas will be significantly less buoyant than that modeled in the application and may, therefore, increase modeled ambient concentrations of criteria pollutants. At $26,158/ton SO_2 removed, wet FGD is not cost-effective as BACT.

17. *Please provide manufacturer, model numbers and design specifications for the fabric filters, ESPs, continuous monitoring systems used for these systems. Rules 62-4.070 and 62-212.400, F.A.C.*

FCS Response: The manufacturer, model number, and design specifications for the fabric filters and continuous monitoring systems have not been determined at this time. This information can be provided when a vendor is selected for this equipment. Note that there are no electrostatic precipitators (ESPs) proposed for the new kiln project.

18. *Does Florida Crushed Stone or its parent company have any current violations of Department regulations at any of their facilities? Please provide all documentation in relation to these violations. Rule 62-4.070(5), F.A.C.*

[3] J. L. Gaines (RTP) phone conversations with J. Jones (Wheelabrator Air Pollution Control) February, 2005.

FCS Response: To the best of our knowledge, FCS has only one outstanding/unresolved compliance issue pending with the FDEP. In 2002, FCS self reported, to the FDEP, environmental damage that occurred from the crossing of several, intermittent seepage pathways by an exploratory survey/drilling crew at FCS's Cobb Road property in Hernando County, Florida. The impacts have since naturally restored to pre-existing conditions. A formal conclusion to this issue, in the form of a Consent Order, has been in abeyance pending the outcome of permitting activity covering this land parcel.

To the best of our knowledge, FCS's U.S. parent, Rinker Materials Corporation, has no outstanding/unresolved compliance issues pending with the FDEP. In an abundance of caution as to disclosure, we wish to note that Rinker Materials of Florida, Inc., a sister company to FCS (also a subsidiary of Rinker Materials Corporation), has requested an extension of a compliance deadline in a voluntary Consent Order between the FDEP and Rinker Materials of Florida, Inc. due to hurricane related impacts.

19. *Rule 62-212.400(5)(h) 5, F.A.C. requires the applicant to provide information relating to the air quality impact 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 or modification would affect. Please provide this information. The additional impacts section 7.0 does not adequately address this requirement.*

FCS Response: The area the facility will affect is the area of significant impact described in the air quality analysis report. The only pollutant for which the project will have a significant impact is PM_{10}, and the significant impact area for PM_{10} is within a radius of 4.7 kilometers from the proposed facility. The applicant owns a substantial amount of the property in this area, and there has not been significant general commercial, residential, industrial and other growth related to PM_{10} emissions, which have occurred since August 7, 1977, in this area.

20. *Please update the application with the detailed building structure information used in the modeling to determine downwash impacts. This information should include building dimensions for all buildings used in the modeling analyses. In addition, please provide the detailed facility layout to scale of the facility showing the exact location of the modeling origin in meters and the location from this modeling origin of each building and stack. All stacks and buildings should be labeled. In addition, a grid with 100 meter spacing should be overlaid over this plot plan so that the information on the plot plan can be easily correlated with the information in the BPIP files. Additionally fence lines or physical barriers which preclude access to non-ambient air should be shown. Non-ambient air is the atmosphere over land owned or controlled by the source and to which public access is precluded by a fence or other physical barrier.*

FCS Response: The following table presents dimensions for all buildings used in the BPIP analysis, and the following figure presents the facility layout showing the location of each building (same numbering system as in the table) and source information.

Dimensions for Buildings used in the Brooksville BPIP Analysis

Building #	Building Name	BPIP ID	Ht (m)	Width (m)	Length (m)
1	Kiln 2 - Precalciner	precalc	80.5	19.8	15.0
2	Kiln 2 Structure	kiln2	21.3	5.4	39.1
3	Kiln 1 - Gepol Preheater	gepol1	80.0	11.0	11.1

Building #	Building Name	BPIP ID	Ht (m)	Width (m)	Length (m)
4	Kiln 2 - Raw Meal Structure	rawmeal2	53.0	11.9	25.0
5	Kiln 2 - Clinker Cooler	clkcool2	11.0	29.0	18.0
6	Coal Mill	coalmill	35.0	21.0	12.0
7	Kiln 1 - Clinker Cooler	clkcool1	9.0	31.0	17.0
8	Iron Ore Bin	irbin	12.0	4.0	4.0
9	Filter Dust Bin	fdbin	31.0	8.0	7.0
10	Boiler room	blrroom	35.0	61.0	75.0
11	Boiler room B	blrroom-b	38.0	34.0	26.0
12	Kiln 2 - Raw Mill	rawmill2	34.0	20.0	16.0
13	Kiln 2 - Main baghouse	mainbag2	25.0	27.7	20.6
14	Raw Material Storage Building	rawmat	34.0	236.3	36.1
15	Kiln 1 - Main baghouse	mainbag1	23.0	27.5	40.5
16	Kiln 2 - Clinker Finish	clkfnsh2	30.0	21.2	15.8
17	Electrical Building	elecrm	5.0	22.1	9.8
18	Kiln 1 - Raw Mill	rawmill1	37.0	29.7	14.9
19	Kiln 1 - Clinker Finish Building	clkfnsh1	33.0	13.0	41.4
20	Kiln 2 - Clinker Finish Building	clkfnsh2	30.0	16.8	33.2
21	Kiln 1 Structure	kiln1	18.0	6.3	65.8
22	Raw Meal Storage Silos	rawmeal1a	65	11.0	11.0
23	Raw Meal Storage Silos	rawmeal1b	65	11.0	11.0
24	Fly Ash Bin	fabin	41	10.0	10.0
25	SILO74A	SILO74A	61	10.0	10.0
26	SILO74B	SILO74B	61	10.0	10.0
27	SILO74C	SILO74C	61	10.0	10.0
28	SILO74D	SILO74D	61	10.0	10.0
29	SILO75	SILO75	62	22.7	22.7
30	SILO76	SILO76	62	22.7	22.7
31	SILO33	SILO33	61	20.4	20.4
32	SILO35A	SILO35A	61	20.4	20.4
33	SILO35B	SILO35B	61	20.4	20.4
34	SILO35C	SILO35C	61	20.4	20.4
35	SILO43	SILO43	61	7.0	7.0

RTP ENVIRONMENTAL ASSOCIATES, INC.®

Layout for Buildings used in the Brooksville BPIP Analysis

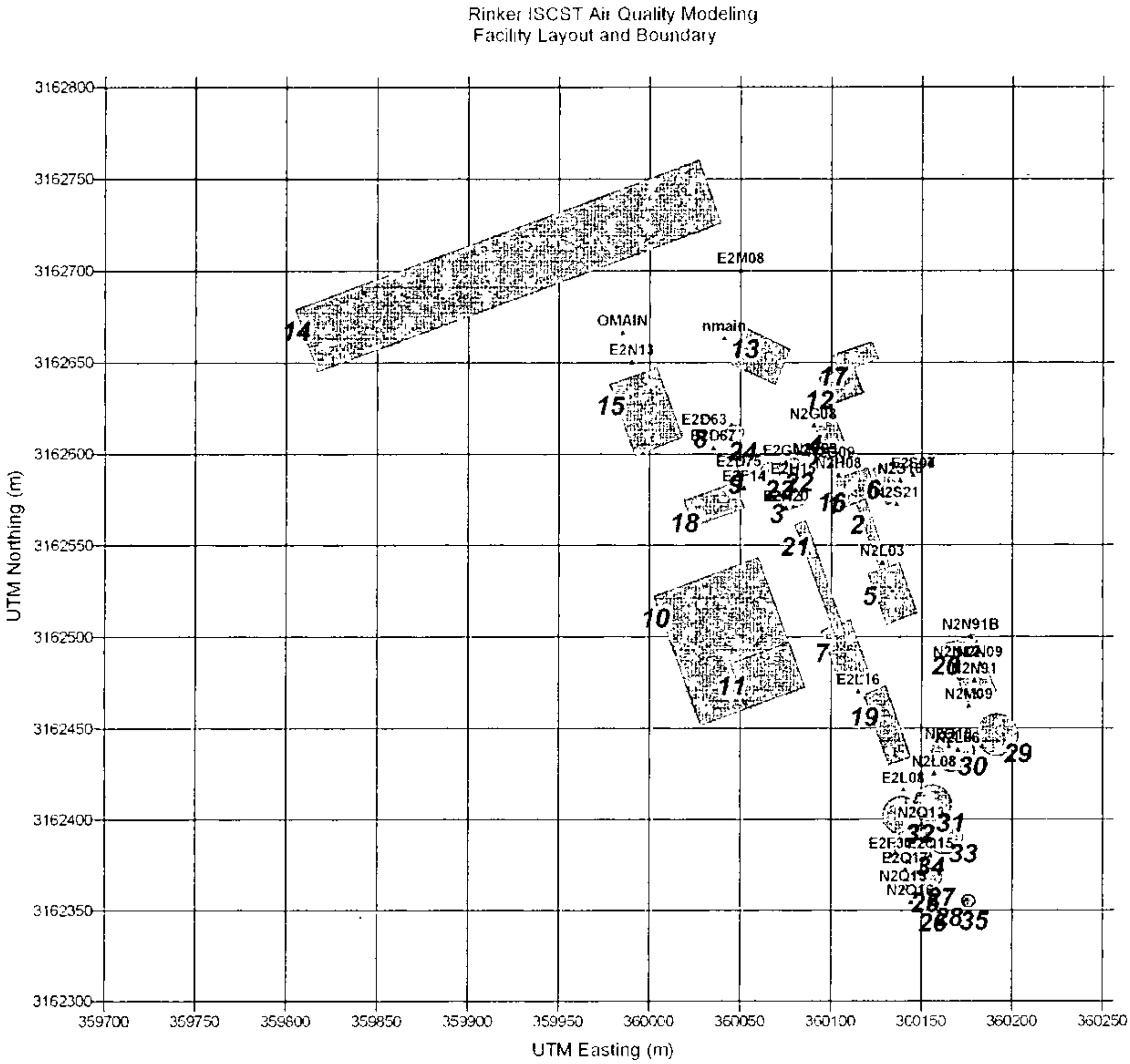
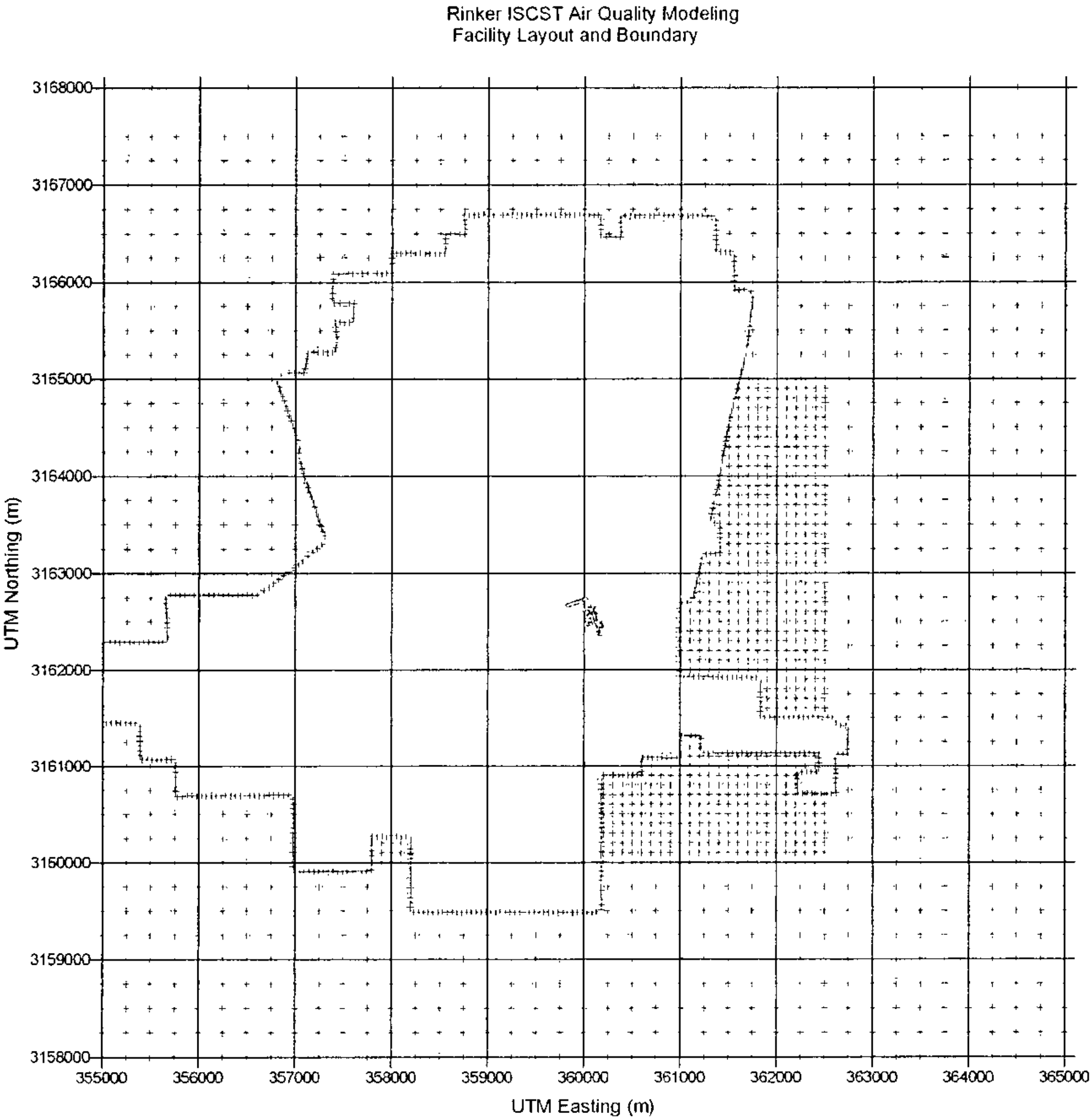


Figure 6-1 in the permit application shows the receptor grid and fencelines, and a close-up of the fenceline and receptor grid is presented in the following figure. Note that the coordinate system used is UTM, so there is no origin relative to the facility; instead, the drawings, BPIP, and ISC files are all geo-referenced to the UTM system.



21. *The worst case operational scenarios should be used in the impact modeling. Emissions rates based on a 30 day average limit are not appropriate for evaluating the impacts on short-term standards and increments. Please provide short-term modeling based on the worst case 3 and 24 hour emission rates expected.*

FCS Response: The modeling for short-term standards and increments that was submitted with the application did utilize worst-case short-term emission rates, not 30 day averages. Tables 3-1 and 6-1 of the application present the short-term SO_2 and CO emission rates that were modeled, and these are appreciably higher than the BACT 30 day average values. For example, the 30 day average SO_2 BACT limit is equivalent to 26.8 lb/hr, while the 3-hr SO_2 emission rate modeled was 57.5 lb/hr.

21. The worst case operational scenarios should be used in the impact modeling. Emissions rates based on a 30 day average limit are not appropriate for evaluating the impacts on short-term standards and increments. Please provide short-term modeling based on the worst case 3 and 24 hour emission rates expected.

FCS Response: The modeling for short-term standards and increments that was submitted with the application did utilize worst-case short-term emission rates, not 30 day averages. Tables 3-1 and 6-1 of the application present the short-term SO_2 and CO emission rates that were modeled, and these are appreciably higher than the BACT 30 day average values. For example, the 30 day average SO_2 BACT limit is equivalent to 26.8 lb/hr, while the 3-hr SO_2 emission rate modeled was 57.5 lb/hr.

22. The United States Fish and Wildlife Service (FWS) has established a concern threshold for nitrogen deposition in the Chassahowitzka Class I area and requires an evaluation of this deposition. Please provide this evaluation.

FCS Response: Because the distance to the Chassahowitzka National Wildlife Refuge (CNWR) is less than 50 km and the Calpuff model was not used in the modeling analysis, nitrogen deposition at the Class I area has been calculated using the ISCST3 NO_2 modeling results and the procedure described in the "Interagency Workgroup on Air Quality (IWAQM) Modeling Phase 1 report, Inset 2". The following table presents the calculations that convert the average annual NO_2 concentration from the proposed project to a nitrogen deposition rate of 0.28 kg/hectare-yr. This nitrogen deposition rate can be compared to the current total nitrogen deposition rate (based on the 1999-2003 average wet nitrogen deposition at the CNWR, (doubled to take into account dry deposition according to recommendations in "Screening Methodology for Calculating ANC Change to High Elevation Lakes", USFS Rocky Mountain Region, January 2000) of 20 kg/hectare-yr. The project impact is only 3% of the current nitrogen deposition rate.

Maximum Annual NO2 Concentration (ug/m3)	0.059
Molecular Weight Conversion Ratio	1.37
Deposition velocity (m/sec)	0.05
Conversion factor (sec/yr)	31536000
Calculated Project HNO3 Deposition Flux ug/m2/yr	127452.7
Calculated Project HNO3 Deposition Flux kg/ha-yr	1.27
Calculated Project N Deposition Flux kg/ha-yr	0.283
1999-2003 NADP Wet N Deposition Rates (kg/ha/yr)	10
Estimated Existing Total N Deposition rates (kg/ha/yr)	20
Project Impacts as % of Existing Deposition	3%

The National Park Service (NPS) and the U.S. Fish and Wildlife Service (FWS) have developed criteria for evaluating the contribution of additional nitrogen (N) to deposition within Class I areas. The Deposition Analysis Thresholds (DATs) are deposition thresholds that trigger a closer review, but they do not represent the deposition amount that constitutes an adverse impact to the environment. DATs have been calculated based on estimates of natural background deposition, a factor of 50% to account for the range of natural variability for ecosystems, and a "individual source contribution" factor of 4%. The N deposition DAT for the Eastern Class I areas is 0.01 kg/ha/yr. Based on the conservative ISCST3 analysis results presented above, the proposed new kiln will result in N deposition that exceeds the DAT.

Both the NPS and the FWS utilize a case-by-case approach to permit review for modeled deposition values that are higher than the DAT. This approach considers the best scientific information available for each park or refuge to assess existing as well as potential future deposition impacts. This would include evaluating the potential deposition impacts from a source not just in relation to the DAT, but with other factors as well. Given that the N deposition analysis used the conservative ISCST3/IWAQM methodology, that N deposition impacts are a small fraction of existing N deposition levels, and that the NOx BACT being proposed for the new kiln is the lowest rate listed in the RACT/BACT/LAER clearinghouse, the overall conclusion is that the N deposition impacts from the Unit II kiln are acceptable.

23. *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 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 (5 km in this case) instead of at the center of the facility. This means that all sources within the significant impact area should be modeled. Please provide a detailed table showing how the 20 D rule was applied to the cumulative PM inventory submitted with this application.*

FCS Response: The attached CD provides the 20-D inventory development spreadsheet.

24. *The preferred ambient background concentrations for the NAAQS compliance demonstration should be the maximum annual concentration measured at a representative monitoring location. An average of the highest concentrations over several years is not appropriate for this assessment.*

FCS Response: The only pollutants for which the annual baseline concentrations were based on multi-year averages were PM_{10} and $PM_{2.5}$ due to the form of the standard. When the maximum concentration is selected for any year, the PM_{10} annual baseline is revised from 17.4 to 19.4 ug/m^3, and the $PM_{2.5}$ annual baseline is revised from 12.6 to

15.1 ug/m^3. These new background values have been used in the revised NAAQS impact analysis included in Attachment A.

25. *Please provide a detailed list of the parameters used in the fugitive PM_{10} modeling. Please provide the value and supporting information for the silt loading factor used to estimate the paved road emissions inputs in this modeling. The details of the PM_{10} point, area and volume sources associated with the facility, including existing sources, along with associated stack parameters should be provided. In addition, have all quantifiable fugitive emissions, other than paved road emissions been included in the PM_{10} modeling analysis? Also provide information on the precautions to prevent emissions of unconfined particulate matter.*

FCS Response: The parameters used for the fugitive PM_{10} modeling of truck and auto traffic are presented in the table below.

Fugitive Volume Road Source Parameters used in Rinker Modeling

Number of sources	70
Actual Dimensions	20 m X 20 m
Release Ht	1 m
Sigma Y	9.3 m (20m/ 2.15) per ISC Manual, page 3-27
Sigma Z	3 m (6.5m /2.15) per ISC manual, page 3-27
Hours of operation	16 hours /day
Emissions	.01096 g/s per source - 0.76 g/s total (6.1 lbs/hr) - 97 lbs/day

According to AP-42 Section 13.2.1- Paved Roads, fugitive PM_{10} emissions from paved roads are directly related to the "silt loading" present on the road surface (as well as the average weight of vehicles traveling the road). Silt loading (sL) refers to the mass of silt-size material (equal to or less than 75 µm in physical diameter) per unit area of the road surface. The silt loading factor used for the Brooksville analysis was based on a representative default AP-42 value of 0.4 gr/m^2 (from AP-42 Table 13.2.1-2) for low average daily traffic roads. A control efficiency was then applied, which corresponds to the control practices at Brooksville of water flushing and street sweeping approximately two to three times per day. The control efficiencies for water flushing and street sweeping are based on values from Table 2-4 from EPA's Control of Open Fugitive Dust, assuming that 1/3 of the daily traffic occurs between each flushing/sweeping operation.

It should be noted that the same default AP-42 value of 0.4 gr/m^2 was previously used in the Suwannee American Cement Plant and Florida Rock Cement Plant permit applications. Florida Rock has recently conducted silt loading tests at their Newberry facility (Florida Rock stated that sweeping occurs at Newberry, but not water flushing, so the control measures used at Brooksville should result in even lower silt loading than at Newberry). Florida Rock reported a silt loading factor of 0.14 gr/m^2 (it should be noted that a very conservative assumption was made by the contractor to account for some sample loss, and this reported value represents an upper bound on the actual silt loading). The reported value is similar to the controlled silt loading value of 0.086 used for the Brooksville calculations; therefore these actual tests at a similar cement plant confirm the reasonableness of the silt loading used in the Brooksville calculations.

The details of the PM_{10} point sources associated with the Brooksville facility, including existing sources, were provided in Tables 3-2 and 6-2 of the permit application report. The details of the paved road volume sources associated with the facility, including paved road emissions from existing operations (which were conservatively estimated by doubling the paved road emissions for the proposed Unit II kiln, even though the capacity of the existing kiln is less than the capacity of proposed Unit II kiln), are provided in Table 3-2 of the permit application report. There are no other area or fugitive sources associated with the Brooksville facility (the kiln feed material is inherently wet, and so the covered storage piles for kiln feed materials are not sources of fugitive

PM emissions). There are no other reasonably quantifiable fugitive emissions from the Brooksville facility. It should be noted that the existing fugitive emissions from the Gregg Mine were modeled based on FDEP inventory data, as presented in Table 6-5 of the permit application report. Also, the existing allowable emissions from the Unit I kiln and power plant were included in the cumulative modeling analysis.

Precautions to prevent emissions of unconfined particulate matter are included as Condition 8 of Section II in the Title V permit (No.: 0530021-002-AV) and include "Reasonable precautions to prevent emissions of unconfined particulate matter at this facility during operations include: chemical or water application of dust suppressants on roads and construction sites, landscaping and planting of vegetation."

26. *The kiln stack temperature used in the air quality modeling is 560.9 degrees K, which is at least 100 degrees K hotter than the projected temperatures for similar kilns in the area, including the existing kiln at Florida Crushed Stone. Please explain.*

FCS Response: Revised stack flow and temperature data has been obtained from the plant engineer for a variety of operating conditions (i.e., direct operation with mill off versus compound operation with mill on at four production levels). Attachment A presents a revised modeling analysis using this revised stack flow and temperature data. The nominal stack flow and temperature for 2800 tpd operations (compound operation with mill on) is 311,700 acfm at 237 degrees F (387 degrees K).

Please do not hesitate to contact me at (732) 968-9600 if you require further information.

Sincerely,

Donald F. Elias
Principal

SEAL
Barry D. Andrews, P.E.

Enclosures: Attachment A: Revised Pages to Replace in Original Application
Attachment B: Letters from Polysius Corp. Regarding Kiln Maximum Design Capacity and Heat Input
Attachment C: Typical Raw Materials and Fuels Analyses
Attachment D: Existing Startup, Shutdown, and Malfunction Plan

Cc: C. Allen
S. Benyon
M. Vardeman
D. Dee, Esq.
J. Varn, Esq.
M. Podrez
D. Taylor
Project File RMBR

Attachment A

Revised Pages to Replace in Original Application

Volume I – Application Text

- Revised pages 2-3, 3-1, 3-3, 3-4, 3-7 through 3-11, 4-29, 5-5, 6-2, 6-3, 6-7 through 6-13, 6-15 through 6-19, 7-7 through 7-9

Volume II – Application Forms and Appendices

The permit application forms have been modified as follows:

Kiln System:
- Added a hot gas generator in the raw mill (32 MM Btu/hr) (Part B)
- Added a 10 MM Btu/hour pre-heater (Part B)
- Corrected the burner sizes for the kiln and pre-calciner (Part B and Part D)
- Corrected the stack height to 350 feet (Part C)
- Changed the baghouse ACFM to 324,000 (Part A, Part C)
- Changed the baghouse exhaust temp to 250°F (Part C)
- Removed the shaft dryer (Part D item 1)
- Included five additional fuels: natural gas, petcoke, propane, fly ash, on-spec oil (using #2 heat value).
- Re-calculated the associated emission rates to reflect "normal" operation and added startup, shutdown and non routine emissions to the PTE for SO2, CO, and VOC.
- Revised the emissions for lead and added emissions for dioxin/furan.

Minor Sources (with baghouses):
- Flow rates, throughput rates, and emissions have been corrected for some sources.

Revised Appendices:
- Appendix C-1: Rinker Brooksville Plant Unit II: SNCR Cost Estimates
- Appendix C-2: Rinker Brooksville Plant Unit II: SCR Cost Estimates
- Appendix C-3: Rinker Brooksville Plant Unit II: Cost Estimates for SO_2 Control (Technology 1)
- Appendix C-4: Rinker Brooksville Plant Unit II: Cost Estimates for SO_2 Control (Technology 2)
- Appendix C-5: Rinker Brooksville Plant Unit II: Cost Estimates for SO_2 Control (Technology 3)
- Appendix C-6: Rinker Brooksville Plant Unit II: Cost Estimates for SO_2 Control (Technology 4)

TABLE 2-1

PSD POLLUTANT APPLICABILITY

POLLUTANT	POTENTIAL INCREASE IN FACILITY EMISSIONS (tons/year)	PSD SIGNIFICANT EMISSION RATES (tons)	SUBJECT TO PSD REVIEW
PM/PM_{10} (including minor and fugitive sources)	256.4	25/15	YES
SO_2	122.7	40	YES
NO_x	1126.2	40	YES
CO	2133.6	100	YES
VOC	105.3	40	YES
H2SO4	5.1	7	NO
Hg	0.0751	0.1	NO
Pb	0.375	0.6	NO

3.0 AIR POLLUTANT EMISSION ESTIMATES

The high temperature combustion process used to produce cement in a kiln results in the emission of air pollutants. The air pollutants that will be emitted from the proposed Unit II kiln above Prevention of Significant Deterioration (PSD) significant levels are particulate matter (PM), particulate matter with a mean aerodynamic diameter less than ten microns (PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO) and volatile organic compounds (VOC). Other pollutants resulting from the production of cement include mercury (Hg), Beryllium (Be), lead (Pb), sulfuric acid mist (H2SO4 mist), and dioxin/furan. The potential to emit for these constituents are less than the PSD significant levels. Other sources of air pollutants include auto and truck traffic, and baghouse PM control devices on various material handling systems. These other sources will result in additional emissions of PM/PM_{10}, and insignificant quantities of SO_2, NO_x, CO, and VOC.

The production capacity of the proposed Unit II cement kiln is based on 2800 tpd clinker production for the daily and annual rate (the annual capacity for 365 days of operation is 1,022,000 tons clinker), and the hourly maximum production rate is 3000 tpd clinker production. Emission rates from all sources associated with the proposed Unit II kiln have been reviewed relative to New Source Performance Standards, National Emission Standards for Hazardous Pollutants, and the proposed Best Available Control Technology (BACT) requirements and meet all applicable emission limitation. Based on the emission rate calculations presented in this section, the addition of the Unit II kiln will result in emission increases of the following criteria pollutants above the PSD significant emission rates: PM/PM_{10}, SO_2, NO_x, VOC, and CO.

Section 3.1 of the permit application describes the emission controls and associated potential emission rates proposed for the Rinker Unit II cement kiln and ancillary equipment. Section 3.2 describes the sources of information used to develop criteria pollutant emission estimates.

TABLE 3-1

SUMMARY OF POLLUTANT EMISSIONS

Pollutant	Emission Factor lb/ton [a]	Max Hourly Emissions (lb/hr)	Annual Emissions including Starup/Shutdown [b] (tons/yr)
PM/PM10 (kiln)	0.2	41.3	168.6
PM/PM10 (minor)	-	-	85.7
PM/PM10 (fugitive) [c]	-	-	2.12
PM/PM10 (total)	-	-	256.4
SO2 [d]	0.23	57.5 3-hr 35.78 24-hr	122.7
NOx [e]	1.95	-	1126.2
CO [f]	4	1000	2133.6
VOC [g]	0.19	71.3	105.3
H2SO4	0.01	1.25	5.1
Hg	1.47E-04	0.018375	0.0751
Be	6.60E-07	0.00008	0.000337
Pb	7.34*10-4	0.0942	0.375
Dioxin/Furan [h]	-	-	1.18E-06
Maximum Hourly Clinker Production Rate (tons/hr)			125.0
Maximum Hourly Kiln Dry Feed Rate (tons/hr)			206 3
Daily and Annual Clinker Production Rate (tons/day)			2800
Daily and Annual Kiln Dry Feed Rate (tons/day)			4620

FOOTNOTES:

a - The lb/ton emission factors are based on lbs/ton of dry kiln feed for PM/PM10 and lbs/ton of clinker production for other pollutants.

b - The annual emission calculations include startup/shutdown/non-routine NOx emissions, based on estimate of 336 hours per year.

c - Fugitive PM/PM10 hourly rate is based on typical 16 hrs/day of trucking operations.

d - After consideration of startup/shutdown and short-term process variations, the maximum 3-hr SO2 emission rate is 57.5 lb/hr, and the maximum 24-hr SO2 rate is 35 78 lb/hr (based on 7hrs @ 57.5 lb/hr plus 17hrs @ "normal rate" of 26.83 lb/hr)

e - The NOx emission factor for startup/shutdown and short-term process variations is 8 lb/ton-clinker.

f - After consideration of startup/shutdown and short-term process variations, the maximum 1-hr CO emission rate is 1000 lb/hr.

g - The VOC emission factor for startup/shutdown and short-term process variations is 0.57 lb/ton-clinker.

h - The Dioxin/Furan emission factor is from 40 CFR 63 Subpart LLL.

TABL[illegible]-2

SUMMARY: MINOR SOURCES AND ASSOCIATED PARTICULATE MATTER EMISSIONS

EMISSION UNIT LEGEND NUMBER	EMISSION UNIT DESCRIPTION	EMISSION UNIT EQUIPMENT NUMBER	DUST COLLECTOR EQUIPMENT NUMBER	PROCESS RATE	GRAIN LOADING	FLOWRATE	EMISSIONS	
				(tons/hr)	(grains/acf)	(ACFM)	lbs/hr	tons/yr
	Filter Dust A	2E-22 A	2G-08	225	0.01	5,000	0.336	1.47
	Filter Dust B	2E-22 B	2G-09	225	0.01	16,500	1.143	5.01
	Raw Meal Transport	2F-04	2F-09	225	0.01	3,750	0.260	1.14
	Kiln Feed Transport	2H-05	2H-08	210	0.01	3,750	0.260	1.14
	Clinker Transport	2L-01	2L-03	125	0.01	3,000	0.190	0.83
	Gypsum Bin	2L-14	2L-08	150	0.01	4,000	0.320	1.40
	Clinker Storage Silo	2L-05	2L-06	104	0.01	4,000	0.253	1.11
	Finish Mill Collecting Belt	2M-04	2M-09	276	0.01	12,000	0.832	3.64
	Finish Mill	2N-01	2N-12	411	0.01	35,000	2.310	10.12
	Air Slide	2N-03	2N-91	411	0.01	6,000	0.403	1.77
	Bucket Elevator	2N-04	2N-91	411	0.01	6,000	0.403	1.77
	High Efficiency Separator	2N-06	2N-09	411	0.01	128,600	9.199	40.29
	Cement Cooler	2N-26	2N-91	138	0.01	6,000	0.403	1.77
	Cement Transport A	2P-01	2Q-10	138	0.01	3,700	0.256	1.12
	Cement Transport B	2P-01	2Q-13	138	0.01	12,000	0.832	3.64
	Cement Loadout Bin	2Q-28	2Q-15	540	0.01	3,000	0.208	0.91
	Cement Loadout Bin	2Q-31	2Q-16	540	0.01	3,000	0.208	0.91
	Coal Mill	2S-15	2S-16	18	0.01	22,000	1.600	7.01
	Pulverized Fuel Bin	2S-20	2S-21	18	0.01	2,000	0.145	0.64
	Totals						**19.561**	**85.69**

due to the lack of raw feed that "consumes" the heat energy and the fact that the operator will intentionally keep the kiln and pre-heater "hot" such that when feed is restored, the process will be ready to accept the feed again.

Kiln Inlet Buildup – This phenomenon occurs as a normal course of pre-heater tower operations and is particularly prevalent during start-up conditions. This is primarily due to the instability of the system during this period where a coating is formed at the base of the riser duct, in the area of the venturi. In general, the pressure drop in that area increases, due to the restriction, capacity of the system goes down, and hence, the specific volume of air through the system goes up from 1.6 Nm^3/kg to 2.0+Nm^3/kg. In addition, the oxygen content goes from 4% to 6-8%. Consequently, the NO_x emissions will increase to approximately 5 – 7 lb/ton.

Kiln Flush/Avalanche - These events are characterized by a large quantity of raw feed surging through the system so quickly and in such a large mass that the available system heat cannot process the meal, and as such, it flows unprocessed (unburned and with a high free CaO content) through the kiln to the cooler. This situation occurs either due to a feed system malfunction or because material that has settled onto the ledges of the system, breaks free and generally occurs gradually during prolonged operation at low pre-heater feed rates. A kiln flush is usually quick and dramatic and may extinguish the main burner flame. It can generate a tremendous pressure spike in the system and generally "cools" the entire pre-heater and kiln so that a system re-start/re-heat is required. NO_x emission rates may go as high as 8 lb/ton.

The annual NO_x PTE calculations consider both normal operations and start-up, shutdown, and non-routine operations. The start-up, shutdown, and non-routine emissions are based on 336 hours per year of start-up, shutdown, and/or non-routine operations, a conservative assumption of the maximum hourly kiln production rate of 125 tons per hour during these periods, and an emission factor of 8 lbs/ton clinker. The normal operation emissions are based on the BACT emission limit, the annual average kiln production rate, and 8,424 hours per year of operation (8,760 – 336). The annual NO_x PTE from Unit II is calculated as:

Normal Operation: 1.95 lbs/ton clinker X 116.67 tons/hour = 227.5 lbs/hr

227.5 lbs/hour X (8760-336 hrs)/2000 = 958.2 tpy

During startup, shutdown and non-routine activities, NOx emissions will be

8 lbs/ton clinker X max 125 tons/hour = 1000 lb/hr

1000 lbs/hr X 336 hr/yr/2000 = 168.0 tpy

Total Tons/Year = 958.2 + 168.0 = 1126.2 tpy

3.1.3 SO_2 Emissions

The approximate composition of typical raw feed to Unit II will be 50% "high rock" (marly limestone), 39% waste fines (marlaceous lime with high silica content), 10% conditioned fly ash, and the remainder iron mill scale. The raw feed mill grinds moist feed to the desired particle size, and dries the ground feed via direct contact with flue gases. The mill is, therefore, an effective mass transfer device that promotes absorption of SO_2 by limestone in the feed. In addition, there is additional control of acid gases from the un-reacted alkaline by-products in the dust cake, which coats the bags of the fabric filter. The Unit II SO_2 annual emissions are based on the proposed BACT SO_2 emission limit of 0.23 lbs SO_2/ton (30-day average).

During Unit II start-up and non-routine (malfunction) conditions, it is possible that short-term SO_2 emissions may increase due to process variabilities. Therefore, a maximum 1-hour SO_2 emission rate of 57.5 lb/hr (based on 0.46 lbs SO_2/ton clinker) is proposed.

The annual SO_2 PTE calculations consider both normal operations and start-up, shutdown, and non-routine operations. The start-up, shutdown, and non-routine emissions are based on 336 hours per year of start-up, shutdown, and/or non-routine operations, a conservative assumption of the maximum hourly kiln production rate of 125 tons per hour during these periods, and an emission factor of 0.46 lbs/ton clinker. The normal operation emissions are based on the BACT emission limit, the annual average kiln production rate, and 8,424 hours per year of operation (8,760 – 336). The annual SO_2 PTE from Unit II is calculated as:

Normal Operation: 0.23 lbs/ton clinker X 116.67 tons/hour = 26.83 lbs/hr

26.83 lbs/hour X (8760-336 hrs)/2000 = 113.0 tpy

During startup, shutdown and non-routine activities, SO_2 emissions will be

0.46 lbs/ton clinker X max 125 tons/hour = 57.5 lb/hr

57.5 lbs/hr X 336 hr/yr/2000 = 9.66 tpy

Total Tons/Year = 113.0 + 9.66 = 122.7 tpy

3.1.4 CO Emissions

Good combustion practice is proposed as BACT for Unit II, with a CO emission limit of 4.0 lbs CO/ton of clinker produced (30-day average).

During Unit II start-up and non-routine (malfunction) conditions, it is possible that short-term CO emissions may increase due to process variabilities. Therefore, a maximum 1-hour CO emission rate of 1000 lb/hr (based on 8 lbs CO/ton of clinker) is proposed.

The annual CO PTE calculations consider both normal operations and start-up, shutdown, and non-routine operations. The start-up, shutdown, and non-routine emissions are based on 336 hours per year of start-up, shutdown, and/or non-routine operations, a conservative assumption of the maximum hourly kiln production rate of 125 tons per hour during these periods, and an emission factor of 8 lbs/ton clinker. The normal operation emissions are based on the BACT emission limit, the annual average kiln production rate, and 8,424 hours per year of operation (8,760 – 336). The annual CO PTE from Unit II is calculated as:

Normal Operation: 4 lbs/ton clinker X 116.67 tons/hour = 466.7 lbs/hr

466.7 lbs/hour X (8760-336 hrs)/2000 = 1965.6 tpy

During startup, shutdown and non-routine activities, CO emissions will be

8 lbs/ton clinker X max 125 tons/hour = 1000 lb/hr

1000 lbs/hr X 336 hr/yr/2000 = 168.0 tpy

Total Tons/Year = 1965.6 + 168.0 = 2,133.6 tpy

3.1.5 VOC Emissions

Good combustion practice is proposed as BACT for Unit II, with a VOC emission limit of 0.19 lbs VOC/ton of clinker produced (30-day average).

During Unit II start-up and non-routine (malfunction) conditions, it is possible that short-term VOC emissions may increase due to process variabilities.

The annual VOC PTE calculations consider both normal operations and start-up, shutdown, and non-routine operations. The start-up, shutdown, and non-routine emissions are based on 336 hours per year of start-up, shutdown, and/or non-routine operations, a conservative assumption of the maximum hourly kiln production rate of 125 tons per hour during these periods, and an emission factor of 0.57 lbs/ton clinker. The normal operation emissions are based on the BACT emission limit, the annual average kiln production rate, and 8,424 hours per year of operation (8,760 – 336). The annual VOC PTE from Unit II is calculated as:

Normal Operation: 0.19 lbs/ton clinker X 116.67 tons/hour = 22.167 lbs/hr
22.167 lbs/hour X (8760-336 hrs)/2000 = 93.37 tpy
During startup, shutdown and non-routine activities, VOC emissions will be
0.57 lbs/ton clinker X max 125 tons/hour = 71.3 lb/hr
71.3 lbs/hr X 336 hr/yr/2000 = 11.98 tpy
Total Tons/Year = 93.37 + 11.98 = 105.35 tpy

3.1.6 Lead, Mercury, Beryllium, Sulfuric Acid Mist Emissions, and Dioxin/Furan

Emissions of lead (Pb), mercury (Hg), beryllium (Be), sulfuric acid mist (H_2SO_4), and dioxin/furan from cement plants result from the oxidation of these materials in the fuel and raw feed materials. EPA's AP-42 Section 11.6 provides an emission factor for Be from cement kilns (6.6E10-7 pounds per ton clinker) utilizing similar technology. Based on a review of stack test data from other similar Portland cement kilns and based on best engineering judgement, the lead emissions have been estimated at 750 lb/yr (equivalent to $7.34*10^{-4}$ pounds per ton of clinker).

The mercury and H_2SO_4 mist emission factors were based on current stack test data from similar kilns operating in Florida[1], with an added compliance margin. The emission factors are 1.47E-04 pounds per ton clinker for mercury and 0.01 pounds per ton clinker for H_2SO_4 mist.

The dioxin/furan emission factor is based on 40 CFR 63, Subpart LLL. The emission factor is 1.7E-10 gr/dscfm at 7% oxygen. Based on a corrected gas flow of 184,950 dscfm (7% oxygen), this is equivalent to an emission rate of 2.69E-07 lb/hr.

The calculated Unit II emissions for these pollutants are presented in Table 3-1.

3.2 INFORMATION SOURCES

Emissions and operational information reviewed during the emission factor development include:

1) The RACT/BACT/LAER Clearinghouse (RBLC);
2) EPA's AP-42 Emission factor Document;
3) Recent permit actions;
4) Recent stack tests for similar cement kilns;
5) Correspondence with the Florida Department of Environmental Protection and other state agencies; and
6) Correspondence with other cement manufacturers.

1 Conversation between Mike Vardeman of Rinker and John Koogler of Koogler Assoc, 12/14/04, and email from John Koogler to Andrea Adams of RTP on 12/15/04.

Table 4-4
Rinker Unit II Cement Kiln
Top-Down BACT Impact Analysis Summary

Pollutant	Control Alternative Added to Baseline	Emission Rates: Uncontrolled lb/ton CL	Emission Rates: Uncontrolled ton/yr*	Emission Rates: Controlled lb/ton CL	Emission Rates: Controlled ton/yr*	Control Effic. %	Economic Impacts: Emission Reduction (ton/yr)	Economic Impacts: Annualized Cost ($/yr)	Cost Effectiveness: Average	Cost Effectiveness: Incremental	Environmental Impacts: Toxics (Yes/No)	Environmental Impacts: Adverse (Yes/No)	Energy Impact Increment Over Baseline (MMBtu/yr)	Selected as BACT?
PM/PM10	"Top" Control Alternative Selected for PM/PM10													
SO_2	Wet Scrubber	0.23	118	0.012	5.9	95%	111.7	$2,920,676	$26,158	$44,361	No	Yes†	Flue gas reheat (natural gas - not quantified)	No
	Semi-Dry Scrubber	0.23	118	0.069	35.3	70%	82.3	$1,617,231	$19,657	$20,048	No	Yes‡	NA	No
	Dry Injection - Vendor-Supplied Contact Tower	0.23	118	0.205	0	10.9%	12.8	$311,435	$24,241	$24,241	No	No	NA	No
	Dry Injection - Preheat Tower	0.23	118	0.205	105	10.9%	12.8	$225,439	$17,547	$17,547	No	No	NA	No
NO_x	SCR**	2.7	1,380	1.70	869	37%	511	$7,709,482	$15,087	$52,916	No	No	89	No
	SNCR**	2.7	1,380	1.95	996	28%	383	$949,455	$2,477	Base	No	No	NA	Yes
CO	RTO	4.0	2,044	0.20	102	95%	1,942	$14,921,000	$7,684	--	No	No	Flue gas reheat (natural gas - not quantified)	No
VOC	RTO	0.15	76.7	0.023	11.8	84.7%	64.9	$14,921,000	$229,918	--	No	No	Flue gas reheat (natural gas - not quantified)	No

*Basis: 2,800 ton CL/day
SCR = Selective Catalytic Reduction
SNCR = Selective Noncatalytic Reduction
RTO = Regenerative Thermal Oxidizer
CL = Clinker
NA = Not available or not calculated
**Refer to Appendix C for NOx cost effectiveness calculation spreadsheets:
Appendix C-1 SNCR Cost Estimates
Appendix C-2 SCR Cost Estimates
Appendices C-3 thru C-6 SO_2 Control Cost Estimates
†Water consumption, solid waste disposal, continuous steam plume
‡Water consumption, intermittent steam plume

TABLE 5-3
AMBIENT AIR QUALITY MONITORING DATA

Pollutant/	-------Hernando County-------			------Pasco Co-------		---Citrus County[a]---		--Pinellas County--	
Avg.Time/Year	053-0005	053-0009	053-0004	101-0005	101-2001	017-0003	017-0005	103-5003	103-5002
PM_{10}/24-hour Second-Highest Concentration (ug/m^3)									
2003	34	26	33	---	---	---	---	---	---
2002	29	38	25	---	---	---	---	---	---
2001	57	**58**	46	---	---	---	---	---	---
PM_{10}/Annual Arithmetic Mean Concentration (ug/m^3)									
2003	16.3	15.5	15.8	---	---	---	---	---	---
2002	16.6	17.0	14.3	---	---	---	---	---	---
2001	**19.4**	18.9	18.8	---	---	---	---	---	---
O_3/1-hour Maximum Concentration, Second-Highest Day (ppb)									
2003	---	---	---	91	99	---	---	---	97
2002	---	---	---	86	87	---	---	---	78
2001	---	---	---	83	91	---	---	---	95
3-year Fourth-highest	---	---	---	90	92	---	---	---	**95**
O_3/8-hour Maximum Concentration, Fourth-Highest Day (ppb)									
2003	---	---	---	77	80	---	---	---	77
2002	---	---	---	69	74	---	---	---	67
2001	---	---	---	74	78	---	---	---	80
3-year Arith. Average	---	---	---	73	**77**	---	---	---	74
SO_2/3-hour Second-Highest Concentration (ppb)									
2003	---	---	---	---	---	42	74	55	---
2002	---	---	---	---	---	34	80	72	---
2001	---	---	---	---	---	36	**167**	75	---
SO_2/24-hour Second-Highest Concentration (ppb)									
2003	---	---	---	---	---	8	17	10	---
2002	---	---	---	---	---	7	16	15	---
2001	---	---	---	---	---	6	**35**	18	---
SO_2/ Annual Arithmetic Mean Concentration (ppb)									
2003	---	---	---	---	---	0.8	2.0	1.9	---
2002	---	---	---	---	---	0.8	1.8	2.3	---
2001	---	---	---	---	---	0.8	**2.7**	2.5	---

[a]Data missing for 1/1/01-3/31/01 for both Citrus County sites as well as 7/1/02-12/31/02 and 4/1/03-6/30/03 for 017-0003 so annual averages for 2001 (both sites) and 2002-2003 (017-0003) not representative.

RTP ENVIRONMENTAL ASSOCIATES, INC.®

TABLE 5-3 (Concluded)
AMBIENT AIR QUALITY MONITORING DATA

Pollutant/	--Citrus--	Hillsborough County							Pinellas County			
Avg./Yr	017-0005	057-1075	057-1070	057-1073	057-1066	057-0030	057-1065	057-0081	103-2006	103-2008	103-3005	103-0018
$PM_{2.5}$/24-hour Concentration – 98th Percentile(ug/m^3)												
2003	19.0	21.5	---	---	---	21.4	---	---	---	---	---	---
2002	19.4	24.0	---	---	---	20.6	---	---	---	---	---	---
2001	23.8	29.9	---	---	---	27.0	---	---	---	---	---	---
3-year Avg.	20.7	**25.1**	---	---	---	23.0	---	---	---	---	---	---
$PM_{2.5}$/Annual Arithmetic Mean Concentration (ug/m^3)												
2003	8.7	11.2	---	---	---	11.6	---	---	---	---	---	---
2002	8.6	11.4	---	---	---	10.7	---	---	---	---	---	---
2001	9.8	**15.1**	---	---	---	11.8	---	---	---	---	---	---
NO_2/Annual Arithmetic Mean Concentration (ppb)												
2003	---	---	---	---	---	---	9.7	6.9	---	---	---	9.8
2002	---	---	---	---	---	---	10.6	7.0	---	---	---	11.2
2001	---	---	---	---	---	---	11.1	7.4	---	---	---	**11.5**
CO/1-hour Second-Highest Concentration (ppm)												
2003	---	---	**5.7**	---	---	---	---	---	3.2	3.1	---	---
2002	---	---	5.3	---	---	---	---	---	2.7	3.7	---	---
2001	---	---	5.1	---	---	---	---	---	2.5	4.0	---	---
CO/8-hour Second-Highest Concentration (ppm)												
2003	---	---	3.3	---	---	---	---	---	1.1	1.8	---	---
2002	---	---	**3.8**	---	---	---	---	---	1.7	2.3	---	---
2001	---	---	3.0	---	---	---	---	---	1.5	2.1	---	---
Pb/Maximum Quarterly Arithmetic Mean Concentration (ug/m^3)												
2003	---	---	---	0.25	0.74	---	---	---	---	---	**0.01**	---
2002	---	---	---	0.41	1.27	---	---	---	---	---	0.01	---
2001	---	---	---	0.47	1.29	---	---	---	---	---	0.01	---

Note: The selected baseline concentrations summarized on Table 5-4 are **bolded**.

TABLE 6-1
PROPOSED KILN SOURCE CHARACTERISTICS

Parameter/Operating scenario	Case 1 Kiln 2 Annual Rate	Case 2 Kiln 2 Max Rate	Case 3 Kiln 2 Mid-Load	Case 4 Kiln 2 Low-Load	Case 5 Kiln 2 Startup
Kiln production rate	2800	3000	2500	2370	NA
Stack Height (ft agl)	350				
Stack Height (m agl)	106.7				
Stack Diameter (ft)	13.6				
Stack Diameter (m)	4.15				
Stack Flow (ACFM)	311,700	324,000	290,200	283,200	300,500
Stack Exit Velocity (m/sec)	10.90	11.33	10.15	9.90	10.51
Stack Temperature (F)	237	250	217	210	439
Stack Temperature (K)	387.0	394.3	375.9	372.0	499.3
SO2 Emission rate (lb/hr)	28.01	35.78	35.78	35.78	57.50
NOx Emission rate (lb/hr)	257.1	243.75	203.13	192.56	NA
PM Emission rate (lb/hr)	38.50	41.25	34.38	32.59	NA
CO Emission rate (lb/hr)	487.1	1000.0	1000.0	1000.0	1000.0

TABLE 6-2
SOURCE CHARACTERISTICS FOR MATERIAL HANDLING BAGHOUSE PM_{10} SOURCES

Name	ISC ID #	Vent #	UTM East m	UTM North m	Flow Rate (ACFM)	Temp (F)	PM_{10} Emissions (lbs/hr)	PM_{10} Emissions (tons/yr)	Stack Ht m	Stack Dia m	Temp K	Velocity m/sec
Filter Dust; 2E-22	N2G08	2G-08	360090	3162615	5,000	200	0.336	1.47	59.1	0.52	366.5	11.19
Filter Dust; 2E-22	N2G09	2G-09	360100	3162594	16,500	180	1.143	5.01	59.1	1.01	355.4	9.80
Raw Meal Transport; 2F-04	N2F09	2F-09	360091	3162596	3,750	180	0.260	1.14	9.1	0.43	355.4	12.37
Kiln Feed Transport; 2H-05	N2H08	2H-08	360104	3162588	3,750	180	0.260	1.14	9.1	0.43	355.4	12.37
Clinker Transport; 2L-01	N2L03	2L-03	360128	3162540	3,000	240	0.190	0.83	9.8	0.49	388.7	7.58
Gypsum Bin; 2L-14	N2L08	2L-08	360157	3162425	4,000	95	0.320	1.40	36.6	0.49	308.2	10.11
Clinker Storage; Silo 2L-05	N2L06	2L-06	360170	3162438	4,000	240	0.253	1.11	61.9	0.49	388.7	10.11
Finish Mill Collecting Belt; 2M-04	N2M09	2M-09	360176	3162462	12,000	180	0.832	3.64	4.6	0.70	355.4	14.67
Finish Mill; 2N-01	N2N12	2N-12	360169	3162485	35,000	212	2.310	10.12	39.6	1.22	373.2	14.15
Air Slide 2N-03 & Bucket 2N-04	N2N91	2N-91	360179	3162476	6,000	200	0.403	1.77	14.0	0.55	366.5	11.98
High Efficiency Separator; 2N-06	N2N09	2N-09	360182	3162485	6,000	200	0.403	1.77	39.6	2.29	366.5	11.98
Cement Cooler; 2N-26	N2N91	2N-91	360177	3162500	128,600	160	9.199	40.29	14.0	0.55	344.3	14.79
Cement Transport; 2P-01	N2Q10	2Q-10	360165	3162440	6,000	200	0.403	1.77	61.9	0.49	366.5	11.98
Cement Transport; 2P-01	N2Q13	2Q-13	360150	3162397	3,700	180	0.256	1.12	61.9	0.64	355.4	9.35
Cement Loadout Bin; 2Q-28	N2Q15	2Q-15	360140	3162362	12,000	180	0.832	3.64	9.1	0.43	355.4	17.60
Cement Loadout Bin; 2Q-31	N2Q16	2Q-16	360144	3162354	3,000	180	0.208	0.91	9.1	0.43	355.4	9.90
Coal Mill; 2S-15	N2S16	2S-16	360138	3162585	3,000	180	0.208	0.91	12.2	1.19	355.4	9.90
Pulverized Fuel Bin; 2S-20	N2S21	2S-21	360136	3162572	22,000	150	1.600	7.01	12.2	0.34	338.7	9.35

6.2.2 Load Screening Analysis

In order to determine worst-case source configurations for the proposed kiln, a load screening analysis was performed. The stack volumetric flow rates and emissions for a variety of operating conditions were provided by the kiln vendor, and were used to determine if the lower plume rise associated with low load operations could result in higher short-term ambient impacts, even though the emission rates are lower. For the annual averaging intervals, the normal operating scenario of 2800 stpd production rate and compound operation (mill on) were used.

6.2.3 SIA Modeling Analysis

Once the worst-case configuration for the proposed kiln was determined, the ambient impacts from the proposed kiln, all associated material handling baghouse PM_{10} emissions, and all project related cement truck haul road fugitive PM_{10} emissions were determined. The roadway emissions were modeled as 70 small volume sources, and the source parameters (based on guidance in Table 3-1 of the ISCST3 Users Guide for separated volume sources) included a release height of 1 meter, an initial lateral dimension of 9.3 meters, and an initial vertical dimension of 3 meters.

6.2.4 Cumulative Modeling Analysis

If the ambient impacts of the proposed project alone are greater than the significant impact levels (SIL) for a particular pollutant and averaging interval, then a "multi-source" or cumulative impact analysis must be performed for that particular pollutant and averaging interval. The cumulative analysis considers emissions from existing facility emission units as well as other nearby sources, and consists of separate NAAQS and PSD increment cumulative analyses. For the NAAQS analyses, the modeled impacts from the proposed, existing, and other nearby sources (using maximum allowable emission rates) are added to ambient background concentrations (tabulated in Section 5) and the total concentrations are compared to the NAAQS. For the PSD increment analysis, the appropriate sources and emissions that are modeled are those source changes that have occurred since the applicable baseline date.

6.3 MODELING ANALYSIS RESULTS

6.3.1 Load Screening Modeling Results

Table 6-3 presents the results of the proposed kiln load screening analysis. The analysis was performed with ISCST3 for both the Class II and Class I receptor grids. For the PM_{10} 24-hour impacts, the normal annual operating scenario was equal to any other scenario, and therefore it

Table 6-3
Summary of Proposed Kiln Load Screening Results

Class I

Parameter/Operating scenario	Case 1 Kiln 2 Annual Rate	Case 2 Kiln 2 Max Rate	Case 3 Kiln 2 Mid-Load	Case 4 Kiln 2 Low-Load	Case 5 Kiln 2 Startup	Class I SIL
1-hr X/q (1 lb/hr)	0.0410	0.0375	0.0470	0.0470	0.0290	
3-hr X/q (1 lb/hr)	0.0233	0.0225	0.0238	0.0240	0.0164	
8-hr X/q (1 lb/hr)	0.0098	0.0095	0.0113	0.0113	0.0078	
24-hr X/q (1 lb/hr)	0.0051	0.0049	0.0051	0.0052	NA	
Annual X/q (1 lb/hr)	0.0003	NA	NA	NA	NA	
SO2 Emission rate (lb/hr)	28.01	35.78	35.78	35.78	57.50	
NOx Emission rate (lb/hr)	257.13	243.75	203.13	192.56	NA	
PM Emission rate (lb/hr)	38.50	41.25	34.38	32.59	NA	
CO Emission rate (lb/hr)	487.12	1000.00	1000.00	1000.00	1000.00	
PM 24-hr ug/m3	0.20	0.20	0.18	0.17	NA	0.3
PM Annual ug/m3	0.013	NA	NA	NA	NA	0.2
SO2 3-hr ug/m3	0.65	0.80	0.85	0.86	0.94	1
SO2 24-hr ug/m3	0.14	0.18	0.18	0.19	NA	0.2
SO2 Annual ug/m3	0.010	NA	NA	NA	NA	0.1
NOx Annual ug/m3	0.087	NA	NA	NA	NA	0.1

PSD CLASS II

Parameter/Operating scenario	Case 1 Kiln 2 Annual Rate	Case 2 Kiln 2 Max Rate	Case 3 Kiln 2 Mid-Load	Case 4 Kiln 2 Low-Load	Case 5 Kiln 2 Startup	Class II SIL
1-hr X/q (1 lb/hr)	0.2620	0.2480	0.2910	0.3020	0.2000	
3-hr X/q (1 lb/hr)	0.2220	0.2120	0.2430	0.2500	0.1780	
8-hr X/q (1 lb/hr)	0.1220	0.1150	0.1360	0.1410	0.0980	
24-hr X/q (1 lb/hr)	0.0540	0.0510	0.0610	0.0630	NA	
Annual X/q (1 lb/hr)	0.0036	NA	NA	NA	NA	
SO2 Emission rate (lb/hr)	28.01	35.78	35.78	35.78	57.50	
NOx Emission rate (lb/hr)	257.13	243.75	203.13	192.56	NA	
PM Emission rate (lb/hr)	38.50	41.25	34.38	32.59	NA	
CO Emission rate (lb/hr)	487.12	1000.00	1000.00	1000.00	1000.00	
CO 1-hr ug/m3	128	248	291	302	200	2000
CO 8-hr ug/m3	59	115	136	141	98	500
PM 24-hr ug/m3	2.1	2.1	2.1	2.1	na	5
PM Annual ug/m3	0.14	NA	NA	NA	NA	1
SO2 3-hr ug/m3	6.2	7.6	8.7	8.9	10.2	25
SO2 24-hr ug/m3	1.5	1.8	2.2	2.3	na	5
SO2 Annual ug/m3	0.10	NA	NA	NA	NA	1
NOx Annual ug/m3	0.93	NA	NA	NA	NA	1

was used for all subsequent PM10 cumulative modeling.

6.3.2 Significant Impact Analysis

Table 6-4 presents the results of the project significant impact analysis. For all pollutants besides PM_{10}, the maximum kiln load screening results were used for the the project significant impact analysis. For PM_{10}, the significant impact analysis considered project emissions from the proposed kiln, material handling baghouse PM_{10} emissions, and all project related cement truck haul road fugitive PM_{10} emissions.

The only pollutants and averaging intervals that have significant impacts were PM_{10} annual and PM_{10} 24-hour averages, therefore cumulative NAAQ and PSD increment analyses were performed for this pollutant. The PM_{10} significant impact area was determined to be 4.7 km. Figures 6-2 and 6-3 present isopleth plots for the 24-hr and annual project PM_{10} impacts. The maximum impact locations occur near the eastern facility boundary.

6.3.3 De Minimis Monitoring Levels

The project significant impact results presented in Table 6-4 also compare project ambient impacts to the de minimis monitoring thresholds. The maximum impacts from the proposed project are less than the de minimis monitoring levels for all pollutants except PM_{10}. Ambient air quality background data were reviewed and summarized in Section 5.0 for use in the NAAQS analyses. The PM_{10} background concentrations were compiled from three PM_{10} monitoring sites currently being operated in Hernando County for Rinker Materials. Therefore, the applicant has collected PM_{10} data that meets the de minimis monitoring requirements. For all other pollutants, the applicant is requesting an exemption from pre- or post-construction PSD monitoring requirements for this modification as allowed for under 62-212.400(2)(f) FAC on the basis the project modeled impacts are below the thresholds.

6.3.4 Cumulative Modeling Emission Inventory

Cumulative NAAQ and PSD increment analyses were required for PM_{10}. A PM_{10} emission inventory was obtained from the Department's Bureau of Information Systems of all permitted air emission sources within 55 km of the proposed project (this represents the 5.2 km PM_{10} SIA plus an additional 50 km distance). The modeling inventory for PSD increments and NAAQS analyses were developed from the master inventory. Small, insignificant sources were removed from the master inventory on the basis of the 20-D methodology. The 20-D methodology multiplies the

Table 6-4
Summary of Significant Impact Modeling

Pollutant	Avg. Period	Maximum Project Impact (µg/m³)	Class II SIL (µg/m³)	Class II Cumulative Analysis (Yes/No)	SIA Extent (km)	De Minimis Monitoring Level (µg/m³)	Triggers Monitoring Data Requirement (Yes/No)
NO_2	Annual	0.9	1	NO	--	14	No
SO_2	3-Hr	10.2	25	NO	--	NA	NA
	24-Hr	2.3	5	NO	--	13	No
	Annual	0.1	1	NO	--	NA	NA
CO	1-Hr	302	2000	NO	--	NA	NA
	8-Hr	141	500	NO	--	575	No
PM_{10}	24-Hr	13.7	5	YES	4.7	10	Yes
	Annual	1.8	1	YES	1.4	NA	NA

The extent of the SIA is measured from the location of the proposed kiln stack.

Figure 6-2 PM_{10} 24-hr Project Impacts Plot

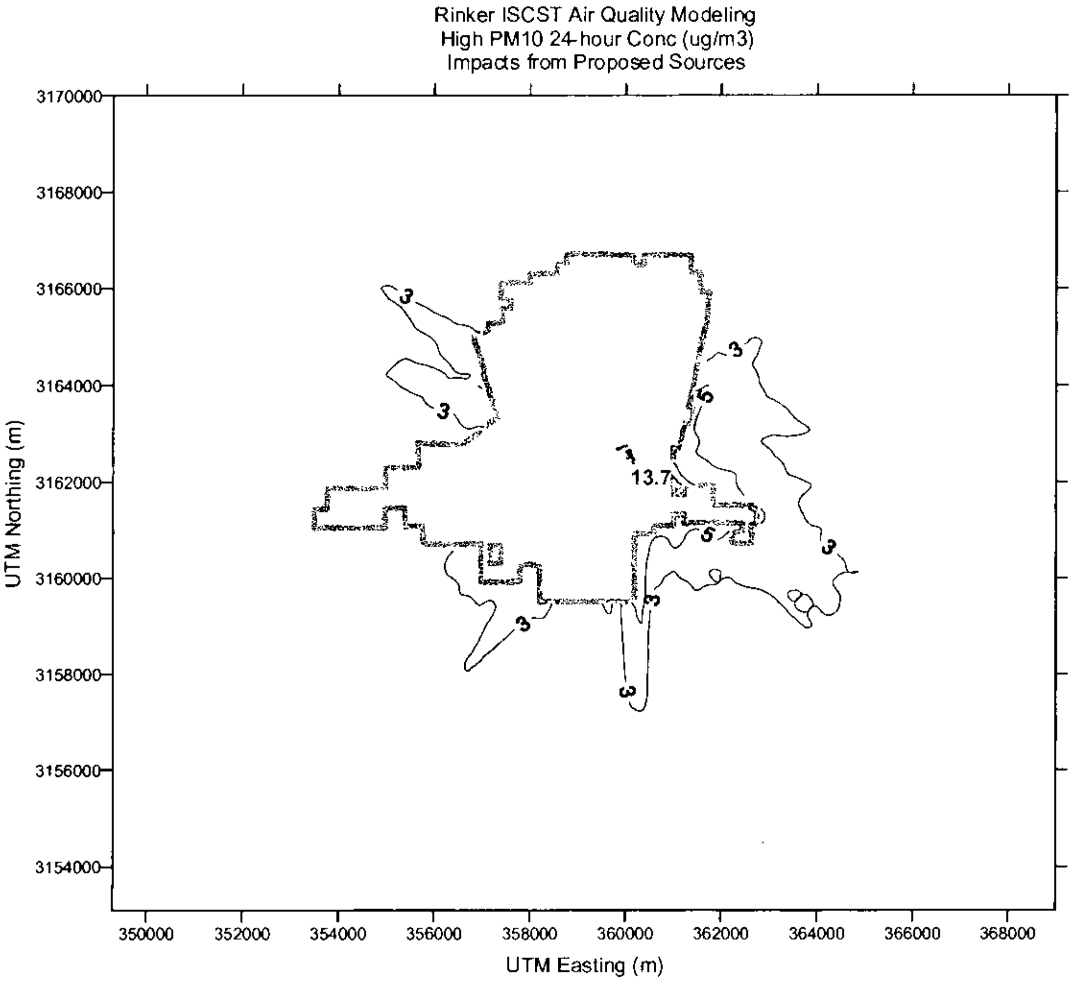
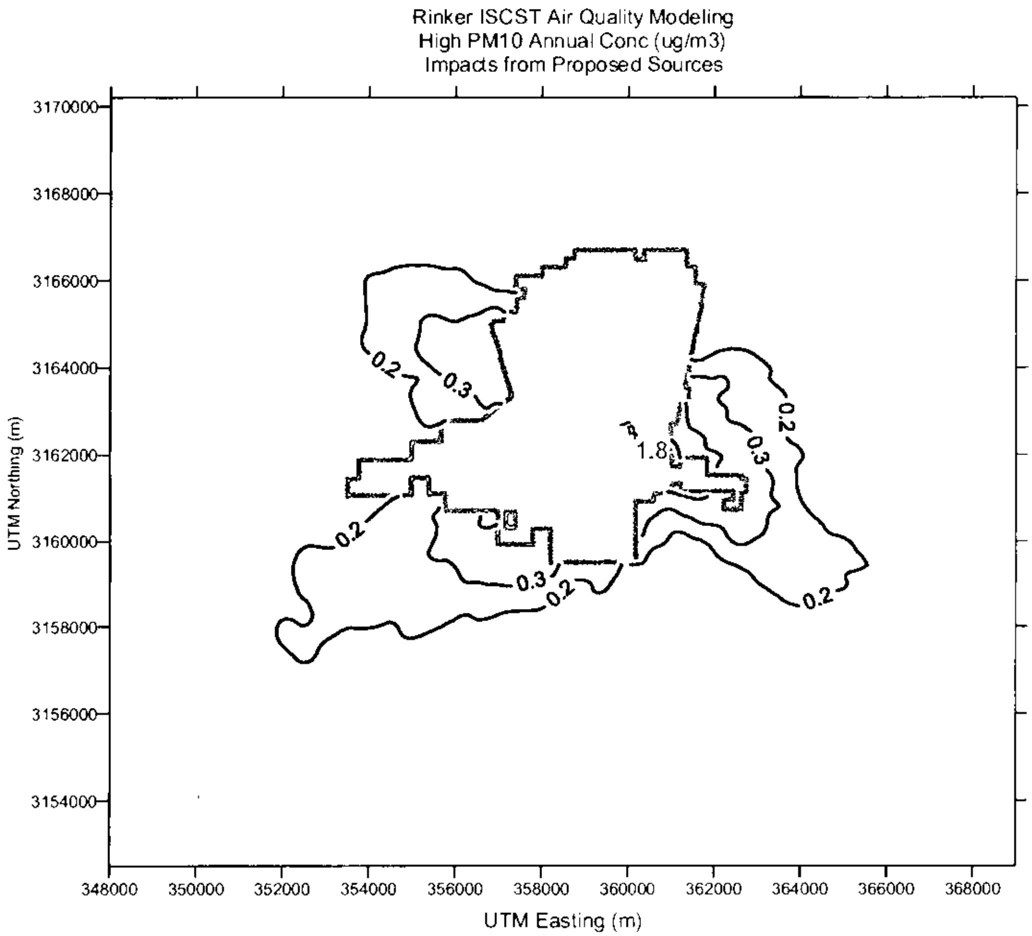


Figure 6-3 PM_{10} Annual Project Impacts Plot



distance between the facility and the proposed project in kilometers (D) by 20, and compares this value to the facility's emissions in tons per year. Any facility where the 20-D value was greater than the emission value is assumed to have a negligible effect on the ambient air concentrations,and was removed from the cumulative inventory. One inventory was developed for use in the Class II area based on the distance to the proposed project, and another inventory was developed for use in the Class I area based on the distance to the Class I area.

Table 6-5 presents the sources that remain after 20-D editing of the inventory, along with the modeling parameters (the complete inventory is submitted in Excel format on the modeling CD-ROM). The sources used in the cumulative analysis include the Crystal River and Anclote power plants, and the Cemex and Gregg Mine sources. Out of these sources included in the cumulative modeling, only the Crystal River 3 and 4 boilers are PSD increment affecting sources (these units were built in the 1980s).

In addition to these other sources, the existing Brooksville cement kiln Unit I, the power plant, the material handling baghouse point sources, and the existing cement haul truck traffic emission sources were also included in the modeling analysis. The maximum permitted emission rates for the existing sources were used. The existing truck traffic PM_{10} emissions were assumed to be equal to the proposed Unit 2 project truck traffic emissions (this is conservative, as the capacity of the existing kiln is lower than the proposed Unit II kiln), effectively doubling the rate for the cumulative analyses. The same 70 volume sources were used to model the existing road emissions. Based on previous modeling of the existing kiln and power plant stack, the worst-case stack temperature and flow conditions were used for the existing stack in the modeling analysis.

6.3.5 Cumulative NAAQS Analysis

Table 6-6 presents the results of the cumulative NAAQS PM_{10} analysis. The maximum 24-hr impact, including background concentrations, is 70% of the 24-hr NAAQS, and the annual impact is 53% of the annual NAAQS. Therefore, compliance with the NAAQS is demonstrated.

6.3.6 Cumulative Class II PSD Increment Analysis

Table 6-7 presents the cumulative Class II PM_{10} increment analysis results. The 24-hr impact is 83% of the 24-hr PSD increment, and the annual impact is 22% of the annual PSD increment. Therefore, compliance with the Class II increments is demonstrated. Figure 6-4 presents the

Table 6-6

Summary of Cumulative NAAQS Modeling

Pollutant/Avg.Period	PM_{10} 24-Hr	PM_{10} Annual
Max. Modeled Impact (mg/m^3)	46.8	7.1
DateTime	1/6/1991	1991
X Coord.(UTM E km)	356.5	356
Y Coord.(UTM N km)	3169	3168.5
Background Conc. (mg/m^3)	58	19.4
Total Conc. (mg/m^3)	104.8	26.5
NAAQS (mg/m^3)	150	50
Percent of NAAQS (%)	70%	53%

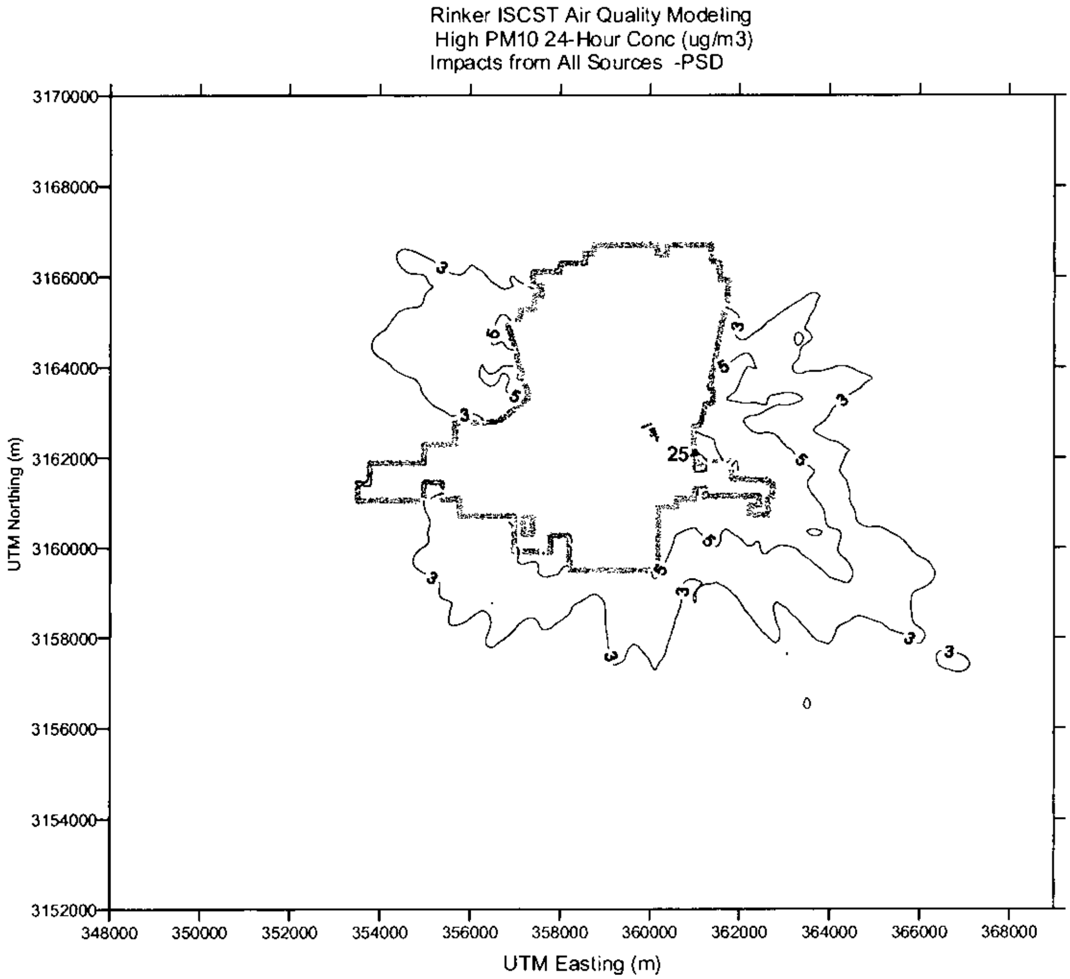
Table 6-7

Summary of Cumulative PSD Increment Impacts – Class II

Pollutant	Avg. Period	Maximum Modeled Impact (μg/m³)	Date Time	X Coord. (UTM E km)	Y Coord. (UTM N km)	Class II PSD Increment (μg/m³)	Percent of Increment (%)
PM_{10}	24-Hr	25.0	09/17/95	360.987	3162.087	30	83.3%
	Annual	3.5	1992	361.000	3162.100	17	22.4%

NOTE – All short-term concentrations are highest-second-high.

Figure 6-4 PM_{10} 24-hr PSD Increment Impacts Plot



isopleth plot for the 24-hr PSD increment impacts. The maximum impact locations occur near the eastern facility boundary

6.3.7 Class I PSD Increment Analysis

This section presents the Class I PSD increment analysis (Section 7 presents the Class I visibility analysis). The first step in the Class I PSD increment analysis is to determine if project impacts are greater than the EPA Class I SILs. If the project impacts are greater than the SILs for a particular pollutant and averaging interval, then a "multi-source" or cumulative impact analysis must be performed for that particular pollutant and averaging interval.

Table 6-8 presents the Class I area significant impact analysis results. All project impacts are below the Class I SILs with the exception of the 24-hr PM_{10} impact. Therefore, a cumulative class I PSD increment analysis was performed for this pollutant and averaging interval. Section 6.3.4 describes the cumulative inventory developed for this project. The only sources determined to be increment consuming were the proposed Brooksville kiln 2 project, the existing Brooksville facility, and the Crystal River power plant number 3 and 4 boilers.

Table 6-9 presents the results of the cumulative Class I PM_{10} increment analysis. The maximum 24-hr impact is 13% of the Class I 24-hr PSD increment. Therefore, compliance with the Class I increments is demonstrated.

6.4 REFERENCES

Auer, A.H., 1978. "Correlation of Land Use and Cover with Meteorological Anomalies," Journal of Applied Meteorology. Vol. 17, pp. 636-643.

Code of Federal Regulations (CFR), Title 40, Protection of the Environment.

Florida Administrative Code (FAC), Title 62, Rules of the Dept. of Environmental Protection.

USEPA, 1995. User's Guide for the Industrial Source Complex (ISC3) Dispersion Models. EPA-454/B-95-003, September 1995.

USEPA, 1990. New Source Review Workshop Manual (Draft). October 1990.

Table 6-8

Summary of Class I Significant Impact Modeling

Pollutant	Avg. Period	Maximum Project Impact (μg/m^3)	Class I SIL (μg/m^3)	Class II Cumulative Analysis (Yes/No)
NO_2	Annual	0.09	0.1	NO
SO_2	3-Hr	0.94	1.0	NO
	24-Hr	0.19	0.2	NO
	Annual	0.009	0.1	NO
PM_{10}	24-Hr	0.8	0.3	YES
	Annual	0.05	0.2	NO

Table 6-9

Summary of Cumulative PSD Increment Impacts – Class I

Pollutant	Avg. Period	Maximum Modeled Impact (μg/m^3)	Date Time	X Coord. (UTM E km)	Y Coord. (UTM N km)	Class I PSD Increment (μg/m^3)	Percent of Increment (%)
PM_{10}	24-Hr	1.31	12/10/1995	331.350	3175.000	10	13.1%

NOTE – All short-term concentrations are highest-second-high.

worst-case meteorological data occurs for the period 00:00 to 06:00, and consists of a wind speed of 2 m/sec and F stability (note that the period 19:00 to 24:00 also has a worst-case condition of 2 m/sec and F stability, but this period occurs after sunset and is of less concern).

The visibility analyses for the project was performed using the latest version of PLUVUE-II (version 96170). Only sky backgrounds were considered since there is no significant terrain in the study area (i.e., views of the plume with terrain in the background would not occur; so white, gray, or black backgrounds were not considered). PLUVUE-II input parameters were generally set equal to the model defaults or recommended values and are shown on Table 7-2. Analyses were performed for spring, summer, and winter seasons (these dates are included on Table 7-2). Appropriate temperatures and relative humidities were selected based on Tampa International Airport data as shown on Table 7-2. Based on the fact that the worst-case meteorology occurs for the period 00:00 to 06:00, and that previous PLUVUE modeling conducted for the proposed second kiln in 1996 demonstrated that the maximum visibility impacts occurred during the hours around sunrise, the PLUVUE simulations were performed for sunrise (or as soon after sunrise as PLUVUE would perform a valid calculation), and for two additional hours after sunrise (using 30 minute increments), for a total of 5 simulations for each season. The time of sunrise was determined using NOAA's Sunrise/Sunset calculation program, and were calculated as 06:30, 05:30, and 07:17 for the spring equinox, summer solstice, and winter solstice, respectively.

Results of the PLUVUE-II analysis are presented in Table 7-3, and are summarized below. Maximum impacts occurred during the summer just after sunrise for an observer within the plume with 110 degrees wind direction. Since the maximum impacts are less than the critical values, it can be concluded that there is little potential for a visible plume as viewed from the CNWR due to the proposed project.

Visibility Impact	Critical Values	Maximum Impact
Delta-E	1.0	0.98
Plume Contrast	> ± 0.02	0.008

TABLE 7-2 PLUVUE-II INPUT DATA

Emissions/Miscellaneous Data	Meteorological/Air Quality Data
Site elevation (feet msl) 0	Worst case Wind speed (mps) 2.0
Number of units 1	Wind meas.ht index for 10 m 1
Stack height (feet) 350	Pasquill-Gifford stability F
Flue gas flowrate (Max rate) (ACFM) 324,000	Lapse rate (F/1000 ft) 13.83
Flue gas exit velocity (m/s) 11.33	Mixing depth (m) 10,000
Flue gas temperature (F) 250	Ambient pressure (atm) 1.0
SO2 emission rate (tons/day) 0.69	Background NO_x conc (ppm) 0.000
NOx emission rate (tons/day) 2.73	Background NO_2 conc (ppm) 0.000
PM emission rate (tons/day) 0.73	Background O_3 conc (ppm) 0.040
Source UTM Coor (km) 360.0,3162.5	Background SO_2 conc (ppm) 0.000
UTM Zone 17	Background coarse conc (ug/m^3) 35.0
Time Zone (relative to GMT) 5	Background visual range (km) 177.0
Model Options based on PLUVUE Defaults	SO_2 deposition velocity (cm/s) 1.0
Aerosol Inputs based on PLUVUE Defaults	NO_x deposition velocity (cm/s) 1.0
	Coarse PM dep. velocity (cm/s) 0.10
	Fine PM dep. velocity (cm/s) 0.10

Observer Data	Direction of 110.5	Direction of 127
South Observer E/N UTM (km)	340.3, 3165.7	
South Observer elevation (ft-msl)	0	
South Critical Plume Distance (km)	19.6	
North Observer E/N UTM (km)	341.84, 3173.74	
North Observer elevation (ft-msl)	0	
North Critical Plume Distance (km)	21.0	
Plume Observer E/N UTM (km)	339.25, 3167.67	
Plume Observer elevation (ft-msl)	0	
Plume Critical Plume Distance (km)	21.0	

TABLE 7-3 PLUVUE-II MODELING RESULTS

Case	Spring			Summer			Winter		
	Time	Delta E	Contrast	Time	Delta E	Contrast	Time	Delta E	Contrast
WD = 110.5 & Observer (1) South of Plume	700	0.80	-0.005	600	0.91	-0.004	745	0.82	-0.007
	730	0.74	-0.006	630	0.81	-0.004	815	0.73	-0.007
	800	0.69	-0.006	700	0.75	-0.004	845	0.71	-0.007
	830	0.68	-0.005	730	0.73	-0.004	915	0.70	-0.007
	900	0.67	-0.005	800	0.70	-0.004	945	0.70	-0.007
WD = 110.5 & Observer (2) North of Plume	700	0.80	-0.006	600	0.80	-0.008	745	0.81	-0.006
	730	0.75	-0.006	630	0.75	-0.008	815	0.72	-0.005
	800	0.71	-0.006	700	0.71	-0.008	845	0.69	-0.005
	830	0.70	-0.005	730	0.69	-0.007	915	0.68	-0.005
	900	0.70	-0.005	800	0.68	-0.007	945	0.69	-0.004
WD = 110.5 & Observer (5) Below/Inside Plume	700	0.85	-0.005	600	0.98	-0.003	745	0.85	-0.006
	730	0.76	-0.005	630	0.87	-0.003	815	0.76	-0.007
	800	0.73	-0.005	700	0.80	-0.003	845	0.73	-0.007
	830	0.72	-0.005	730	0.78	-0.003	915	0.72	-0.007
	900	0.70	-0.005	800	0.75	-0.004	945	0.72	-0.007
WD = 127 & Observer (3) South of Plume	700	0.81	-0.005	600	0.98	-0.001	745	0.81	-0.006
	730	0.72	-0.004	630	0.84	-0.001	815	0.71	-0.006
	800	0.70	-0.004	700	0.78	-0.002	845	0.68	-0.006
	830	0.67	-0.005	730	0.75	-0.002	915	0.67	-0.006
	900	0.66	-0.005	800	0.71	-0.003	945	0.66	-0.006
WD = 127 & Observer (4) North of Plume	700	0.75	-0.007	600	0.78	-0.007	745	0.80	-0.006
	730	0.67	-0.007	630	0.72	-0.008	815	0.72	-0.005
	800	0.66	-0.007	700	0.68	-0.007	845	0.70	-0.005
	830	0.64	-0.006	730	0.66	-0.007	915	0.69	-0.005
	900	0.63	-0.006	800	0.65	-0.007	945	0.69	-0.005
WD = 127 & Observer (6) Below/Inside Plume	700	0.76	-0.007	600	0.81	-0.008	745	0.78	-0.006
	730	0.70	-0.007	630	0.77	-0.008	815	0.70	-0.006
	800	0.68	-0.007	700	0.73	-0.008	845	0.67	-0.006
	830	0.67	-0.007	730	0.71	-0.007	915	0.66	-0.005
	900	0.65	-0.006	800	0.69	-0.007	945	0.66	-0.005

Department of
Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit for a proposed project:

- **subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or**
- **where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or**
- **at an existing federally enforceable state air operation permit (FESOP) or Title V permitted facility.**

Air Operation Permit – Use this form to apply for:

- **an initial federally enforceable state air operation permit (FESOP); or**
- **an initial/revised/renewal Title V air operation permit.**

Air Construction Permit & Revised/Renewal Title V Air Operation Permit (Concurrent Processing Option) – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: Florida Crushed Stone Company	
2. Site Name:	
3. Facility Identification Number 0530021	
4. Facility Location... Street Address or Other Locator: 13011 Cement Plant Road City: Brooksville County: Hernando Zip Code: 34601	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: Charles Allen
2. Application Contact Mailing Address... Organization/Firm: Rinker Materials Street Address: P.O. Box 1508 City: Brooksville: State: Florida Zip Code: 34605
3. Application Contact Telephone Numbers... Telephone: (352) 799 - 7881 ext. Fax: (352) 799 - 6088
4. Application Contact Email Address: callen@rinker.com

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Project Number(s):	
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: NOx - SNCR control Particulate Matter – 311,700 acfm baghouse 2E-19 (@ 2800 tons clinker/day – normal operation)	
2. Control Device or Method Code(s): 140, 017	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 206.3 short tons/hour		
2. Maximum Production Rate: 125 short tons/hour (clinker production)		
3. Maximum Heat Input Rate: million Btu/hr 432		
4. Maximum Incineration Rate: pounds/hr N/A		
	tons/day	
5. Requested Maximum Operating Schedule:		
	24 hours/day	**7 days/week**
	52 weeks/year	**8760 hours/year**
6. Operating Capacity/Schedule Comment:		
Maximum clinker production rate is 125 tons clinker per hour (3,000 tpd). The total heat input is the sum of the heat inputs to three burners. The heat input to the pre-heater is 10 MMBtu/hour. The total heat input to the kiln and pre-calciner is 390 MMBtu/hour. The Raw Mill hot gas generator is rated at 32 MM Btu/hour.		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: 89	2. Emission Point Type Code: 1

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Emissions from the cement kiln, clinker cooler, raw mill system, pre-heater, pre-calciner and shaft dryer all exhaust out of a single stack.
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: Cement Kiln – 66; clinker cooler – 67; raw mill system – 58; pre-heater, pre-calciner, shaft dryer - 65

5. Discharge Type Code: V	6. Stack Height: Feet 350	7. Exit Diameter: Feet 13.6
8. Exit Temperature: °F 237	9. Actual Volumetric Flow Rate: Acfm 311,700	10. Water Vapor: % 15.6

11. Maximum Dry Standard Flow Rate: Dscfm 199,288	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment: Stack exit temperature, flow rate and percent moisture reflect maximum operating conditions with respect to modeling.

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater, pre-calciner. Emissions related to tons of cement clinker produced		
2. Source Classification Code (SCC): 30500706	3. SCC Units: Tons produced	
4. Maximum Hourly Rate: 125	5. Maximum Annual Rate: 1,022,000	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: Maximum hourly production rate = 125 tons clinker/hour Maximum Annual Rate Based on 2,800 tons clinker per day (normal operation) = 116.67 tons/hour 116.67 tons/hour X 8760 hours/year = 1,022,000 tons/year clinker production		

Segment Description and Rate: Segment 2_of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater, and pre-calciner. Emissions related to tons of coal burned.		
2. Source Classification Code (SCC): 39000201	3. SCC Units: Tons	
4. Maximum Hourly Rate: 15	5. Maximum Annual Rate: 131,400	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 2-4 Expected	8. Maximum % Ash: 5-8 Expected	9. Million Btu per SCC Unit: 26*
10. Segment Comment: * Million BTUs per ton of dry coal based on AP-42 factors. Pre-heater (10MMBtu/hr). Kiln and pre-calciner input 390MMBtu/hr. Coal/Petroleum Coke are primary fuels for kiln/pre-calciner.		

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment 3 of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater, pre-calciner. Emissions related to 1000 gallons of oil burned.		
2. Source Classification Code (SCC): 39000502	3. SCC Units: 1000 gallons	
4. Maximum Hourly Rate: 3.08	5. Maximum Annual Rate: 27,031 (100% usage)	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.2-1.0	8. Maximum % Ash: negligible	9. Million Btu per SCC Unit: 140
10. Segment Comment: Rinker can utilize a mixture of fuels for start-up of the cement kiln as well as non-routine operation (emergency fuel replacement). Estimated maximum hours of start-ups and non-routine events per year 28 hours per month. Pre-heater (10MMBtu/hr). Kiln and pre-calciner input 390MMBtu/hr. Raw Mill hot gas generator 32 MM Btu/hr total Btu input = 432. Coal/Petroleum Coke are primary fuels for kiln/pre-calciner.		

Segment Description and Rate: Segment 4 of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater, pre-calciner. Emissions related to tons of petroleum coke burned.		
2. Source Classification Code (SCC):	3. SCC Units: tons	
4. Maximum Hourly Rate: 2.93	5. Maximum Annual Rate: 25,687	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 1.5 - 10	8. Maximum % Ash: 0.05-2.8	9. Million Btu per SCC Unit: 26.6
10. Segment Comment: Coal/Petroleum Coke are primary fuels for kiln/pre-calciner. Petcoke maximum feed percentage = 20% with coal.		

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment 5 of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater, pre-calciner. Emissions related to million cubic feet natural gas burned.		
2. Source Classification Code (SCC):	3. SCC Units: Million cubic feet	
4. Maximum Hourly Rate: 0.41 (100%)	5. Maximum Annual Rate: 3604 (100% usage) 475.2 (based on est. max)	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: negligible	8. Maximum % Ash: negligible	9. Million Btu per SCC Unit: 1050
10. Segment Comment: Rinker can utilize a mixture of fuels for start-up of the cement kiln as well as non-routine operation (emergency fuel replacement). Estimated maximum hours of start-ups and non-routine events per year 28 hours per month. Pre-heater (10MMBtu/hr). Kiln and pre-calciner input 390MMBtu/hr. Raw Mill hot gas generator 32 MM Btu/hr total Btu input = 432. Coal/Petroleum Coke are primary fuels for kiln/pre-calciner.		

Segment Description and Rate: Segment 6 of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater, pre-calciner. Emissions related to tons tires burned.		
2. Source Classification Code (SCC):	3. SCC Units: tons	
4. Maximum Hourly Rate: 1.9	5. Maximum Annual Rate: 16,556	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 1 - 2	8. Maximum % Ash: 1 – 25.2	9. Million Btu per SCC Unit: 31
10. Segment Comment: Maximum tire usage is 15% of total heat input (390 MM Btu/hr X 15% = 58.5 MM Btu/hr		

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment 7 of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater, and calciner. Emissions related to 1000 gallons propane burned.		
2. Source Classification Code (SCC):	3. SCC Units: 1000 gallon	
4. Maximum Hourly Rate: 4.15 (kiln/pre-calciner only)	5. Maximum Annual Rate: 36,345 (100% usage)	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: negligible	8. Maximum % Ash: negligible	9. Million Btu per SCC Unit: 94
10. Segment Comment: Rinker can utilize a mixture of fuels for start-up of the cement kiln as well as non-routine operation (emergency fuel replacement). Estimated maximum hours of start-ups and non-routine events per year 28 hours per month. Kiln and pre-calciner input 390MMBtu/hr. Coal/Petroleum Coke are primary fuels for kiln/pre-calciner.		

Segment Description and Rate: Segment 8 of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater, pre-calciner and pre-calciner. Emissions related to tons high carbon fly ash burned.		
2. Source Classification Code (SCC):	3. SCC Units: tons	
4. Maximum Hourly Rate: 39	5. Maximum Annual Rate: 341,640 (100% usage)	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.9-2	8. Maximum % Ash: 1-2	9. Million Btu per SCC Unit: 10 average (5000-8000 Btu/lb range)
10. Segment Comment: Kiln and pre-calciner input 390MMBtu/hr. Coal/Petroleum Coke are primary fuels for kiln/pre-calciner.		

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment 9 of 9

1. Segment Description (Process/Fuel Type): Cement kiln, clinker cooler, raw mill system, pre-heater and calciner. Emissions related to 1000 gallons of on-spec oil burned.		
2. Source Classification Code (SCC): 39000502	3. SCC Units: 1000 gallons	
4. Maximum Hourly Rate: 3.08	5. Maximum Annual Rate: 27,031 (100% usage)	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.2-1.0	8. Maximum % Ash: negligible	9. Million Btu per SCC Unit: 140
10. Segment Comment: Rinker can utilize a mixture of fuels for start-up of the cement kiln as well as non-routine operation (emergency fuel replacement). Estimated maximum hours of start-ups and non-routine events per year 28 hours per month. Pre-heater (10MMBtu/hr). Kiln and pre-calciner input 390MMBtu/hr. Raw Mill hot gas generator 32 MM Btu/hr total Btu input = 432. Coal/Petroleum Coke are primary fuels for kiln/pre-calciner. Only "on-spec" oil as defined in 40CFR279 will be used. The oil will not be hazardous waste as defined in Rule 62-210.200, F.A.C. or 40CFR part 261		

Segment Description and Rate: Segment __ of _

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NO_x	2. Total Percent Efficiency of Control: See BACT Analysis, Main Report
3.Potential Emissions: 1,126.2 tons/year, 1000 lbs/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0

8. Calculation of Emissions:

Normal Operation: 1.95 lbs/ton clinker X 116.67 tons/hour = 227.5 lbs/hr (2,800 tons clinker/day)
227.5 lbs/hour X (8760-336 hrs)/2000 = 958.2 tpy

During startup, shutdown and non-routine activities, NO_x emissions will be:
8 lbs/ton clinker X max 125 tons/hour = 1000 lb/hr. The facility estimates that this may occur 336 hr/yr. The potential tpy associated with these activities are
1000 lbs/hr X 336 hr/yr/2000 = 168.0 tpy

Total Tons/Year = 958.2 + 168.0 = 1126.2 tpy

Please refer to Main Document, Section 3, for detailed description
Maximum clinker production rate = 3,000 tons per day

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
Please refer to permit application document for additional information.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control:
3. Potential Emissions: 122.7 tons per year, 57.5 lb/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: Reference: BACT Analysis	7. Emissions Method Code: 0

8. Calculation of Emissions:

Normal Operation: 0.23 lbs/ton clinker X 116.67 tons/hour = 26.83 lbs/hr (2,800 tons clinker/day)
26.83 lbs/hour X (8760-336 hrs)/2000 = 113.0 tpy

During startup, shutdown and non-routine activities, maximum SO_x hourly emissions will be: 0.46 lbs/ton clinker X max 125 tons/hour = 57.5 lb/hr. The facility estimates this may occur 336 hr/yr. The potential tpy associated with these activities are 57.5 lbs/hr X 336 hr/yr/2000 = 9.66 tpy

Total Tons/Year = 113.0 + 9.66 = 122.7

Please refer to Main Document, Section 3, for detailed description
Maximum clinker production rate = 3,000 tons per day

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
SO_2 controlled by alkaline nature of cement kiln flue gas. See Main document.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 168.6 tons/year, 41.3 lb/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year See Main Document	
6. Emission Factor: Reference: BACT Analysis	7. Emissions Method Code: 0

8. Calculation of Emissions:

Normal Operation:
0.2 lbs/ton kiln feed X 192.55 tons kiln feed/hour = 38.5 lb/hr (based on 4,620 tons feed per day).
38.5 lbs/hour X (8760 hrs)÷2000 = 168.6 tpy

Maximum Hourly Emissions and Feed Rate:
0.2 lbs/ton kiln feed X 206.3 tons kiln feed/hour = 41.3 lb/hr (based on 4,950 tons feed per day).

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
See main document for additional information.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control:
3. Potential Emissions: 168.6 tons/year, 41.3 lb/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year See Main Document	
6. Emission Factor: Reference: BACT Analysis	7. Emissions Method Code: 0

8. Calculation of Emissions:

Normal Operations:
0.2 lbs/ton kiln feed X 192.55 tons kiln feed/hour = 38.5 lb/hr (based on 4,620 tons feed per day).
38.5 lbs/hour X (8760 hrs) ÷ 2000 = 168.6 tpy

Maximum Hourly Emissions and Feed Rate:
0.2 lbs/ton kiln feed X 206.3 tons kiln feed/hour = 41.3 lb/hr (based on 4,950 tons feed per day).

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
See main document for additional information.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3.Potential Emissions: 2,133.6 tons per year, 1000 lbs/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: BACT Analysis	7. Emissions Method Code: 0

8. Calculation of Emissions:

Normal Operation: 4 lbs/ton clinker X 116.67 tons/hour = 466.7 lbs/hr (2,800 tons clinker/day)
466.7 lbs/hour X (8760-336 hrs)/2000 = 1,965.6 tpy

During startup, shutdown and non-routine activities, maximum CO hourly emissions will be: 8 lbs/ton clinker X max 125 tons/hour = 1,000 lb/hr.
The facility estimates that this may occur 336 hr/yr. The potential tpy associated with these activities are
1,000 lbs/hr X 336 hr/yr/2000 = 168tpy

Total Tons/Year = 1,965.6 + 168 = 2,133.6
Please refer to Main Document, Section 3, for detailed description

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
See main document for additional information.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control:
3. Potential Emissions: 105.35 tons per year, 71.3 lbs/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: BACT Analysis	7. Emissions Method Code: 0

8. Calculation of Emissions:

Normal Operation: 0.19 lbs/ton clinker X 116.67 tons/hour = 22.167 lbs/hr (2,800 tons clinker/day)
22.167 lbs/hour X (8760-336 hrs)/2000 = 93.37 tpy

During startup, shutdown and non-routine activities, maximum VOC hourly emissions will be: 0.57 lbs/ton clinker X max 125 tons/hour = 71.3 lb/hr. The facility estimates that this may occur 336 hr/yr. The potential tpy associated with these activities are
71.3 lbs/hr X 336 hr/yr/2000 = 11.98 tpy

Total Tons/Year = 93.37 + 11.98 = 105.35 tpy
Please refer to Main Document, Section 3, for detailed description

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
See main document for additional information.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: Lead (H110)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 750 pounds/year, 0.09 lbs/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: Review of test data from similar sources and best engineering judgment.	7. Emissions Method Code: 0

8. Calculation of Emissions:

Normal clinker production = 2,800 tons/day
7.3×10^{-4} lbs/ton clinker X 116.67 tons clinker/hour = 0.086 lbs/hr
0.086 X 8760 hr/yr = 750 pounds/year

Maximum Hourly Clinker Production = 3,000 tons/day
7.3×10^{-4} lbs/ton clinker X 125 tons clinker/hour = 0.09 lbs/hour

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
See Main document for additional information.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: Mercury (H114)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 150.2 pounds/year, 0.018 lbs/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: AP-42, Section 11.6 (January 1995)	7. Emissions Method Code: 0

8. Calculation of Emissions:

Maximum Hourly Clinker Production = 3,000 tons/day
1.47×10^{-4} lbs/ton clinker X 125 tons clinker/hour = 0.018 lbs/hr

Normal clinker production = 2,800 tons/day
1.47×10^{-4} lbs/ton clinker X 116.67 tons clinker/hour = 0.01715 lbs/hr
0.01715 X 8760 hr/yr = 150.2 pounds/year

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions
Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: Berylium (H021)	2. Total Percent Efficiency of Control:
3.Potential Emissions: 0.67 pounds/year, 0.00008 lbs/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: AP-42, Section 11.6 (January 1995)	7. Emissions Method Code: 0

8. Calculation of Emissions:

Maximum Clinker Production = 3,000 tons/day
6.6 X 10^{-7} lbs/ton clinker X 125 tons clinker/hour = 0.00008 lbs/hr

Normal clinker production = 2,800 tons/day
6.6 X 10^{-7} lbs/ton clinker X 116.67 tons clinker/hour = 0.000077 lbs/hour
0.000077 X 8760 hr/yr = 0.67 pounds/year

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
See Main Document for additional information.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: H_2SO_4 (SAM)	2. Total Percent Efficiency of Control:
3.Potential Emissions: 5.1 tons per year, 1.25 lbs/hr	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: Main Report, Section 3	7. Emissions Method Code: 0
8. Calculation of Emissions: Maximum Clinker Production = 3,000 tons/day 0.01 lbs/ton clinker X 125 tons clinker/hour = 1.25 lbs/hour 1.25 lbs/hour X (8760)÷2000 = 5.5 tons/year Normal clinker production = 2,800 tons/day 0.01 lbs/ton clinker X 116.67 tons clinker/hour = 1.17 lbs/hour 1.17 X 8760 hr/yr÷2000 = 5.1 tons/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: See Main Document for additional information.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: Dixon/Furan

2. Total Percent Efficiency of Control:

3. Potential Emissions: 0.0024 pounds/year, 2.69E-07 lbs/hr

4. Synthetically Limited? ☐ Yes ☒ No

5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A

6. Emission Factor:
$1.7X10^{-10}$ gr/DSCFM @ 7% oxygen
311,700 ACFM

Reference: 40 CFR 63 Subpart LLL TEQ

7. Emissions Method Code: 0

8. Calculation of Emissions:

$$\frac{311{,}700}{} \cdot \frac{acf}{min} \cdot \frac{528}{697} \cdot \frac{760}{760} \cdot \frac{scf}{acf} \cdot 0.844 \cdot \frac{dscf}{scf} = 199{,}288 \text{ dscfm @ 8.0\% O2}$$

$$199{,}288 \text{ dscfm} \left[\frac{20.9\% - 8.0\%}{20.9\% - 7.0\%}\right] = 184{,}950 \text{ dscfm adjusted to 7\% } O_2$$

$$1.70E\text{-}10 \cdot \frac{gr}{dscf} \cdot 184{,}950 \cdot \frac{dscf}{min} \cdot \frac{}{7{,}000} \cdot \frac{lb}{gr} \cdot 60 \cdot \frac{min}{hr} = 2.69E\text{-}07 \text{ lb/hr PCDD}$$

0.0024 Pounds/yr

9. Potential/Estimated Fugitive Emissions Comment:
See Main Document for additional information.

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. **Maximum Process or Throughput Rate:** 225 short tons/hour	
2. **Maximum Production Rate:**	
3. **Maximum Heat Input Rate:**	
4. **Maximum Incineration Rate:** pounds/hr N/A tons/day	
5. **Requested Maximum Operating Schedule:** 24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. **Operating Capacity/Schedule Comment:**	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:
N/A

Dust Collector 2G-08

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:
N/A

5. Discharge Type Code: V	6. Stack Height: Feet 194	7. Exit Diameter: Feet 1.7
8. Exit Temperature: °F 200	9. Actual Volumetric Flow Rate: Acfm 5,000	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 3,920	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:		2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A Dust Collector 2G-09		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: Feet 194	7. Exit Diameter: Feet 3.3
8. Exit Temperature: °F 180	9. Actual Volumetric Flow Rate: Acfm 16,500	10. Water Vapor: % 2
11. Maximum Dry Standard Flow Rate: Dscfm 13,340		12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled				
2. Source Classification Code (SCC): 3-05-006-12		3. SCC Units: Tons transferred or handled		
4. Maximum Hourly Rate: 225	5. Maximum Annual Rate: 1,971,000		6. Estimated Annual Activity Factor: N/A	
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A		9. Million Btu per SCC Unit: N/A	
10. Segment Comment:				

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	017 (2G-08)	N/A	EL
	017 (2G-09)	N/A	EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.336 lb/hour 1.47 tons/year	4. Synthetically Limited? ☐ Yes [X] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: Dust Collector 2G-08 3,920 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.336 lbs/hr 0.336 lbs/hr X 8760 hrs/2000lbs/ton = 1.47 tons/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	**2. Total Percent Efficiency of Control:** 99%
3. Potential Emissions: 1.143 lb/hour 5.01 tons/year	**4. Synthetically Limited?** ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	**7. Emissions Method Code:** 0
8. Calculation of Emissions: Dust Collector 2G-09 13,340 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 1.143 lbs/hr 1.143 lbs/hr X 8760 hrs/2000lbs/ton = 5.01 tons/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 1.48 lb/hour 6.48 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis Dust Collector 2G-09 13,340 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 1.143 lbs/hr 1.143 lbs/hr X 8760 hrs/2000lbs/ton = 5.01 tons/year Dust Collector 2G-08 3,920 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.336 lbs/hr 0.336 lbs/hr X 8760 hrs/2000lbs/ton = 1.47 tons/year Source Total: 1.14 lbs/hr + 0.336 = 1.476 lbs/hour 5.01 tons/yr + 1.47 tons/yr = 6.48 tons/year	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 225 short tons/hour	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate:	
4. Maximum Incineration Rate: pounds/hr N/A tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A

5. Discharge Type Code: V	6. Stack Height: Feet 30	7. Exit Diameter: Feet 1.4
8. Exit Temperature: °F 180	9. Actual Volumetric Flow Rate: Acfm 3,750	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 3,032	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment: Stack characteristics are at typical conditions.

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Cement manufacturing, tons of material handled**		
2. Source Classification Code (SCC): **3-05-006-12**	**3. SCC Units:** **Tons transferred or handled**	
4. Maximum Hourly Rate: 225	**5. Maximum Annual Rate:** **1,971,000**	**6. Estimated Annual Activity Factor: N/A**
7. Maximum % Sulfur: **N/A**	**8. Maximum % Ash:** **N/A**	**9. Million Btu per SCC Unit: N/A**
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.26 lb/hour 1.14 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 3,032 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.26 0.26 lbs/hr X 4.38 = 1.14 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: **Other**	**2. Future Effective Date of Allowable Emissions:**
3. Allowable Emissions and Units: **0.01 grains/DSCF**	**4. Equivalent Allowable Emissions:** **0.26 lb/hour 1.14 tons/year**
5. Method of Compliance: **Visual observations**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on BACT Analysis**	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 210 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A	**tons/day**	
5. Requested Maximum Operating Schedule:	**24 hours/day**	**7 days/week**
	52 weeks/year	**8760 hours/year**
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: Feet 30	7. Exit Diameter: Feet 1.4
8. Exit Temperature: °F 180	9. Actual Volumetric Flow Rate: Acfm 3,750	10. Water Vapor: % 2
11. Maximum Dry Standard Flow Rate: Dscfm 3,032	12. Nonstack Emission Point Height: Feet N/A	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Stack characteristics are at typical conditions.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 210	5. Maximum Annual Rate: 1,839,600	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.0.26 lb/hour 1.14 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 3,032 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.26 0.26 lbs/hr X 4.38 = 1.14 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.26 lb/hour 1.14 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. **Maximum Process or Throughput Rate:** 125 short tons/hour		
2. **Maximum Production Rate:**		
3. **Maximum Heat Input Rate:**		
4. **Maximum Incineration Rate:** pounds/hr N/A	tons/day	
5. **Requested Maximum Operating Schedule:**	24 hours/day	7 days/week
	52 weeks/year	8760 hours/year
6. **Operating Capacity/Schedule Comment:**		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: Feet 32	7. Exit Diameter: Feet 1.6
8. Exit Temperature: °F 240	9. Actual Volumetric Flow Rate: Acfm 3,000	10. Water Vapor: % 2
11. Maximum Dry Standard Flow Rate: Dscfm 2,218	12. Nonstack Emission Point Height: Feet N/A	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Stack characteristics are at typical conditions.		

EMISSIONS UNIT INFORMATION
Section [5] of [18]

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 125	5. Maximum Annual Rate: 1,095,000	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.19 lb/hour 0.83 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 2,218 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.19 0.19 lbs/hr X 4.38 = 0.83 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.19 lb/hour 0.83 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

EMISSIONS UNIT INFORMATION
Section [6] of [18]

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 150 short tons/hour	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate:	
4. Maximum Incineration Rate: pounds/hr N/A tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	 7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:		2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: Feet 120	7. Exit Diameter: Feet 1.6
8. Exit Temperature: °F 95	9. Actual Volumetric Flow Rate: Acfm 4,000	10. Water Vapor: % 2
11. Maximum Dry Standard Flow Rate: Dscfm 3,729		12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Stack characteristics are at typical conditions.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 150	5. Maximum Annual Rate: 1,314,000	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.32 lb/hour 1.4 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 3,729 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.32 0.32 lbs/hr X 4.38 = 1.4 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.32 lb/hour 1.40 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 18	5. Maximum Annual Rate: 157,680	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.15 lb/hour 0.64 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 1,697 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.145 0.145 lbs/hr X 4.38 = 0.64 typy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.15 lb/hour 0.64 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 104 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A		
	tons/day	
5. Requested Maximum Operating Schedule:		
	24 hours/day	**7 days/week**
	52 weeks/year	**8760 hours/year**
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: Feet 203	7. Exit Diameter: Feet 1.6
8. Exit Temperature: °F 240	9. Actual Volumetric Flow Rate: Acfm 4,000	10. Water Vapor: % 2
11. Maximum Dry Standard Flow Rate: Dscfm 2,957	12. Nonstack Emission Point Height: Feet N/A	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Stack characteristics are at typical conditions.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 104	5. Maximum Annual Rate: 911,040	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.25 lb/hour 1.11 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 2,957 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.25 0.25 lbs/hr X 4.38 = 1.11 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	**2. Future Effective Date of Allowable Emissions:**
3. Allowable Emissions and Units: 0.01 grains/DSCF	**4. Equivalent Allowable Emissions:** 0.25 lb/hour 1.11 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

<u>Emissions Unit Operating Capacity and Schedule</u>

1. Maximum Process or Throughput Rate: 276 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A

5. Discharge Type Code: V	6. Stack Height: Feet 15	7. Exit Diameter: Feet 2.3
8. Exit Temperature: °F 180	9. Actual Volumetric Flow Rate: Acfm 12,000	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 9,702	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment: Stack characteristics are at typical conditions.

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 276	5. Maximum Annual Rate: 2,417,760	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.83 lb/hour 3.64 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 9702 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.83 0.83 lbs/hr X 4.38 = 3.64 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.83 lb/hour 3.64 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 411 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A		
	tons/day	
5. Requested Maximum Operating Schedule:		
	24 hours/day	**7 days/week**
	52 weeks/year	**8760 hours/year**
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A

5. Discharge Type Code: V	6. Stack Height: Feet 130	7. Exit Diameter: Feet 4
8. Exit Temperature: °F 212	9. Actual Volumetric Flow Rate: Acfm 35,000	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 26,950	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment: Stack characteristics are at typical conditions.

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled			
2. Source Classification Code (SCC): 3-05-006-12		3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 411	5. Maximum Annual Rate: 3,600,360		6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A		9. Million Btu per SCC Unit: N/A
10. Segment Comment:			

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 2.31 lb/hour 10.12 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 26,950 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 2.31 2.31 lbs/hr X 4.38 = 10.12 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 2.31 lb/hour 10.12 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: Particulate Matter –Vents to Dust Collector 2N-91. 2N-91 is shared with the Air Slide (2N-03) and Bucket Elevator (2N-04) and Cement Cooler (2N-26)	
2. Control Device or Method Code(s): 017	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

<u>Emissions Unit Operating Capacity and Schedule</u>

1. Maximum Process or Throughput Rate: 411 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A		
	tons/day	
5. Requested Maximum Operating Schedule:		
	24 hours/day	**7 days/week**
	52 weeks/year	**8760 hours/year**
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: This source shares Dust Collector 2N-91 with Air Slide (2N-03) and Bucket Elevator (2N-04) and Cement Cooler (2N-26)	

5. Discharge Type Code: V	6. Stack Height: Feet 46	7. Exit Diameter: Feet 1.8
8. Exit Temperature: °F 200	9. Actual Volumetric Flow Rate: Acfm 6,000	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 4,704	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Stack characteristics are at typical conditions. The Air Slide (source 2N-03) shares this dust collector	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 411	5. Maximum Annual Rate: 3,600,360	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: See 2N-04 Bucket Elevator tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: See 2N-04 Bucket Elevator Baghouse	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: See Bucket Elevator Baghouse 2N-91
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: **Particulate Matter –Vents to Dust Collector 2N-91. 2N-91 is shared with Air Slide (2N-03) and Bucket Elevator (2N-04) and Cement Cooler (2N-26)**
2. Control Device or Method Code(s): 017

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 411 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:		2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: Air Slide (2N-03) and Bucket Elevator (2N-04) and Cement Cooler (2N-26)		
5. Discharge Type Code: V	6. Stack Height: Feet 46	7. Exit Diameter: Feet 1.8
8. Exit Temperature: °F 200	9. Actual Volumetric Flow Rate: Acfm 6,000	10. Water Vapor: % 2
11. Maximum Dry Standard Flow Rate: Dscfm 4,704		12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Stack characteristics are at typical conditions.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 411	5. Maximum Annual Rate: 3,600,360	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. **Pollutant Emitted:** PM	2. **Total Percent Efficiency of Control:** 99%
3. **Potential Emissions:** 0.40 lb/hour 1.77 tons/year	4. **Synthetically Limited?** ☐ Yes ☒ No
5. **Range of Estimated Fugitive Emissions (as applicable):** to tons/year N/A	
6. **Emission Factor:** BACT Reference: Main Report	7. **Emissions Method Code:** 0
8. **Calculation of Emissions:** 4,704 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.403 lbs/hr 0.403 lbs/hr X 4.38 = 1.77 tpy Air Slide 2N03 and Cement Cooler 2N-26 also vent to baghouse 2N-91	
9. **Pollutant Potential/Estimated Fugitive Emissions Comment:**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.40 lb/hour 1.77 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 411 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A	

5. Discharge Type Code: V	6. Stack Height: Feet 130	7. Exit Diameter: Feet 7.5
8. Exit Temperature: °F 160	9. Actual Volumetric Flow Rate: Acfm 128,600	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 107,327	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Stack characteristics are at typical conditions.	

EMISSIONS UNIT INFORMATION
Section [12] of [18]

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled			
2. Source Classification Code (SCC): 3-05-006-12		3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 411	5. Maximum Annual Rate: 3,600,360		6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A		9. Million Btu per SCC Unit: N/A
10. Segment Comment:			

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 9.20 lb/hour 40.29 tons/year	4. Synthetically Limited? [ ] Yes [X] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 107,327 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 9.20 9.199 lbs/hr X 4.38 = 40.29 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 9.20 lb/hour 40.29 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 138 short tons/hour	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate:	
4. Maximum Incineration Rate: pounds/hr N/A tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: Air Slide (2N-03) and Bucket Elevator (2N-04) and Cement Cooler (2N-26)	

5. Discharge Type Code: V	6. Stack Height: Feet 46	7. Exit Diameter: Feet 1.8
8. Exit Temperature: °F 200	9. Actual Volumetric Flow Rate: Acfm 6,000	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 4,704	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

Stack characteristics are at typical conditions.

This source vents through baghouse 2N-91 along with sources Air Slide (2N-03) and Bucket Elevator (2N-04)

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled			
2. Source Classification Code (SCC): 3-05-006-12		3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 138	5. Maximum Annual Rate: 1,208,880		6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A		9. Million Btu per SCC Unit: N/A
10. Segment Comment:			

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	**2. Total Percent Efficiency of Control:** 99%
3. Potential Emissions: See Bucket Elevator 2N-04tons/year	**4. Synthetically Limited?** ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	**7. Emissions Method Code:** 0
8. Calculation of Emissions: See Bucket Elevator 2N-04 with baghouse 2N-91	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: See Bucket Elevator 2N-04
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 138 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Dust Collector 2Q-10	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: Cement Transport; 2P-01	

5. Discharge Type Code: V	6. Stack Height: 203	7. Exit Diameter: Feet 1.6
8. Exit Temperature: °F 180	9. Actual Volumetric Flow Rate: Acfm 3,700	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 2,991	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Dust Collector 2Q-13		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: Cement Transport; 2P-01		
5. Discharge Type Code: V	6. Stack Height: Feet 203	7. Exit Diameter: Feet 2.1
8. Exit Temperature: °F 180	9. Actual Volumetric Flow Rate: Acfm 12,000	10. Water Vapor: % 2
11. Maximum Dry Standard Flow Rate: Dscfm 9,702	12. Nonstack Emission Point Height: Feet N/A	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 138	5. Maximum Annual Rate: 1,208,880	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

<u>List of Pollutants Emitted by Emissions Unit</u>

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	017 Dust Collector 2Q-10	N/A	EL
PM	017 Dust Collector 2Q-13	N/A	EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM (Dust Collector 2Q-10)	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.26 lb/hour 1.12 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 2,991 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.26 2Q-10 0.26 lbs/hr X 4.38 = 1.12 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM (Dust Collector 2Q-13)	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.83 lb/hour 3.64 tons/year	4. Synthetically Limited? [ ] Yes [X] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 9,702 DSCFM X 12,000 X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.83 2Q-13 0.83 lbs/hr X 4.38 = 3.64 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

EMISSIONS UNIT INFORMATION
Section [14] of [18]

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

<u>Allowable Emissions</u> Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.26 lb/hour 1.12 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis Dust Collector 2Q-10	

EMISSIONS UNIT INFORMATION
Section [14] of [18]

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

<u>Allowable Emissions</u> Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.83 lb/hour 3.64 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis Dust Collector 2Q-13	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 540 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A	tons/day	
5. Requested Maximum Operating Schedule:	24 hours/day	7 days/week
	52 weeks/year	8760 hours/year
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A	

5. Discharge Type Code: V	6. Stack Height: Feet 30	7. Exit Diameter: Feet 1.4
8. Exit Temperature: °F 180	9. Actual Volumetric Flow Rate: Acfm 3,000	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 2,426	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Stack characteristics are at typical conditions.	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled			
2. Source Classification Code (SCC): 3-05-006-12		3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 540	5. Maximum Annual Rate: 4,730,400		6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A		9. Million Btu per SCC Unit: N/A
10. Segment Comment:			

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.21 lb/hour 0.91 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 2,426 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.208 0.208 lbs/hr X 4.38= 0.91	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.21 lb/hour 0.91 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 540 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A	**tons/day**	
5. Requested Maximum Operating Schedule:	**24 hours/day**	**7 days/week**
	52 weeks/year	**8760 hours/year**
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: Feet 30	7. Exit Diameter: Feet 1.4
8. Exit Temperature: °F 180	9. Actual Volumetric Flow Rate: Acfm 3,000	10. Water Vapor: % 2
11. Maximum Dry Standard Flow Rate: Dscfm 2,426	12. Nonstack Emission Point Height: Feet N/A	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Stack characteristics are at typical conditions.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 540	5. Maximum Annual Rate: 4,730,400	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.21 lb/hour 0.91 tons/year	4. Synthetically Limited? [ ] Yes [X] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 2,426 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.21 0.208 lbs/hr X 4.38 = 0.91 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 0.21 lb/hour 0.91 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

<u>Emissions Unit Operating Capacity and Schedule</u>

1. Maximum Process or Throughput Rate: 18 short tons/hour		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr N/A tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A	

5. Discharge Type Code: V	6. Stack Height: Feet 40	7. Exit Diameter: Feet 3.9
8. Exit Temperature: °F 150	9. Actual Volumetric Flow Rate: Acfm 22,000	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 18,662	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Stack characteristics are at typical conditions.	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 18	5. Maximum Annual Rate: 157,680	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 1.60 lb/hour 7.01 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 18,662 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 1.60 1.6 lbs/hr X 4.38 = 7.01 tpy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.01 grains/DSCF	4. Equivalent Allowable Emissions: 1.60 lb/hour 7.01 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 18 short tons/hour	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate:	
4. Maximum Incineration Rate: pounds/hr N/A tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A	

5. Discharge Type Code: V	6. Stack Height: Feet 40	7. Exit Diameter: Feet 1.1
8. Exit Temperature: °F 150	9. Actual Volumetric Flow Rate: Acfm 2,000	10. Water Vapor: % 2

11. Maximum Dry Standard Flow Rate: Dscfm 1,697	12. Nonstack Emission Point Height: Feet N/A
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360 North (km): 3162.5	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Stack characteristics are at typical conditions.	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Cement manufacturing, tons of material handled		
2. Source Classification Code (SCC): 3-05-006-12	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate: 18	5. Maximum Annual Rate: 157,680	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment:		

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.15 lb/hour 0.64 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year N/A	
6. Emission Factor: BACT Reference: Main Report	7. Emissions Method Code: 0
8. Calculation of Emissions: 1,697 DSCFM X 60 X 0.01 grains/DSCFM X 1 lb/7,000 grains = 0.145 0.145 lbs/hr X 4.38 = 0.64 typy	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 PM

1. Basis for Allowable Emissions Code: Other	**2. Future Effective Date of Allowable Emissions:**
3. Allowable Emissions and Units: 0.01 grains/DSCF	**4. Equivalent Allowable Emissions:** 0.15 lb/hour 0.64 tons/year
5. Method of Compliance: Visual observations	
6. Allowable Emissions Comment (Description of Operating Method): Based on BACT Analysis	

Appendix C-1

Rinker Brooksville Plant Unit II: SNCR Cost Estimates

Appendix C-1

Rinker Brooksville Plant Unit II: SNCR Cost Estimates

(All costs are in 2004 dollars, unless noted otherwise)

	GAS STREAM and EMISSION PARAMETERS	
-- Precalciner capacity (tons clinker/day):	2,800	[Rinker]
-- Uncont.NOx--coal comb. (lb/ton clinker)	2.7	[Polysius]
-- Uncont.NOx--coal comb. (lb/day):	7,560	[calculated]
-- Uncont.NOx--coal comb. (tons/year):	1,380	[calculated]
-- Control efficiency (%):	27.8	[calculated]
-- Controlled NOx (lb/ton clinker):	1.95	[Polysius]
-- Controlled NOx (tons/year):	996	[calculated]
-- NOx removed (tons/year):	383	[calculated]
-- Flue gas flow, post-baghouse (acfm):	324,000	[Polysius]
-- Flue gas temperature, post-baghouse (°F):	350	[Polysius]
-- Supplemental coal requirement (tons/day):	0.5	[Polysius - thermal efficiency reduction attributable to NOx controls - coal equivalent]
-- Ammonia requirement (tons/day):	5.58	[Polysius]
-- Electricity - NH_3 injection (kW)	75.0	[Polysius]

Direct Capital Costs

Equipment Costs		$460,000	Vendor Estimate
Instrumentation		$60,000	Vendor Estimate
Taxes	6%	$31,200	State Sales Tax
Freight	10%	$52,000	EPA, Control Cost Manual, % of Equipment Cost
Total Direct Capital Costs:		$603,200	

Direct Installation Costs

Foundation and Supports	$48,256	8% of TDCC, EPA, Control Cost Manual
Handling and Erection	$84,448	14% of TDCC, EPA, Control Cost Manual
Electrical	$60,320	10% of TDCC, EPA, Control Cost Manual
Piping	$90,480	15% of TDCC, EPA, Control Cost Manual
Painting	$6,032	1% of TDCC, EPA, Control Cost Manual
Site Prep	$25,000	Engineering Estimate
Buildings	$50,000	Engineering Estimate
Total Direct Costs:	$364,536	

Indirect Costs

Engineering Services Package+Startup	$90,000	Vendor Estimate
Construction and Field Expenses	$50,000	Vendor Estimate
Contractor Fees	$10,000	Vendor Estimate
Performance Test	$3,645	1% of TDC, EPA, Control Cost Manual
Contingencies	$145,160	15% of TDCC+TDC, EPA, Control Cost Manual, SNCR Section
Total Indirect Costs:	$298,806	
Total Capital Investment (TCI)	$1,266,542	

ANNUAL COSTS

Inputs:

Operating factor (hours/year):	8,760	
Ammonia price ($/ton):	$176	[Polysius]
Electricity price ($/kWh):	$0.050	[DOE/EIA "Monthly Energy Review," Sept. 2004]
Coal price ($/ton):	$53.67	[DOE/EIA "Quarterly Coal Consumption and Quality Report--Mfg Plants," 10/4/04]
Annual interest rate (REAL,fractional):	0.07	[OMB Circular, 1992]
Control equipment life (years):	20	
Capital recovery factor:	0.0944	[calculated]

Costs:

Operating Labor	$75,000	2,000 man-hr @ $37.5 /man-hr
Supervisory	$11,250	15% of Operating Costs, EPA, Control Cost Manual
Maintenance Labor:	$75,000	2,000 man-hr @ $37.5 /man-hr
Maintenance Materials:	$75,000	100% of Maintenance Labor, EPA, Control Cost Manual
Ammonia:	$358,596	[calculated]
Electricity (aqueous NH_3 injection):	$32,850	[calculated]
Supplemental coal:	$9,795	[calculated - 0.5 tons coal/day x $53.67/ton coal x 365 day/yr]
Overhead	$141,750	60% of total labor and maintenance materials, EPA, Control Cost Manual
Taxes, insurance, & administration:	$50,662	4% of TCI, EPA, Control Cost Manual
Capital recovery:	$119,553	9.44% of TCI, EPA, Control Cost Manual
TOTAL ANNUAL COST:	**$949,455**	[calculated]

AVG. COST-EFFECTIVENESS ($/ton NOx): $ **2,477** [calculated] Tons Removed = 383

NOTE: [1] Source of each number appears in brackets.

Appendix C-2

Rinker Brooksville Plant Unit II:
SCR Cost Estimates

Appendix C-2

Rinker Brooksville Plant Unit II: SCR Cost Estimates

(All costs are in 2004 dollars, unless noted otherwise)

GAS STREAM and EMISSION PARAMETERS		
-- Precalciner capacity (tons clinker/day):	2,800	[Rinker]
-- Uncont.NOx--coal comb. (lb/ton clinker)	2.7	[Polysius]
-- Uncont.NOx--coal comb. (lb/day):	7,560	[calculated]
-- Uncont.NOx--coal comb. (tons/year):	1,380	[calculated]
-- Control efficiency (%):	37	[calculated]
-- Controlled NOx (lb/ton clinker):	1.7	[Polysius]
-- Controlled NOx (tons/year):	869	[calculated]
-- NOx removed (tons/year):	511	[calculated]
-- Flue gas flow, post-baghouse (acfm):	324,000	[Polysius]
-- Flue gas temperature, post-baghouse (°F):	350	[Polysius]
-- Supplemental coal requirement (tons/day):	0.50	[Polysius - thermal efficiency reduction attributable to NOx
-- Ammonia requirement (tons/day):	5.58	[Polysius]
-- Electricity - NH_3 injection (kW)	75.0	[Polysius]

Direct Capital Costs			
Equipment Costs		$2,000,000	Vendor Estimate
Instrumentation		$100,000	Vendor Estimate
Taxes	6%	$126,000	State Sales Tax
Freight	10%	$210,000	EPA, Control Cost Manual, % of Equipment Cost
Total Direct Capital Costs:		$2,436,000	

Direct Installation Costs			
Foundation and Supports	$194,880	8%	of TDCC, EPA, Control Cost Manual
Handling and Erection	$341,040	14%	of TDCC, EPA, Control Cost Manual
Electrical	$243,600	10%	of TDCC, EPA, Control Cost Manual
Piping	$365,400	15%	of TDCC, EPA, Control Cost Manual
Painting	$24,360	1%	of TDCC, EPA, Control Cost Manual
Site Prep	$50,000	Engineering Estimate	
Buildings	$75,000	Engineering Estimate	
Total Direct Costs:	$1,294,280		

Indirect Costs		
Engineering Services Package+Startup	$180,000	Vendor Estimate
Construction and Field Expenses	$100,000	Vendor Estimate
Contractor Fees	$50,000	Vendor Estimate
Performance Test	$12,943	1 % of TDC, EPA, Control Cost Manual
Contingencies	$559,542	15 % of TDCC+TDC, EPA, Control Cost Manual, SCR Section
Total Indirect Costs:	$902,485	
Total Capital Investment (TCI)	$4,632,765	

ANNUAL COSTS

Inputs:		
Operating factor (hours/year):	8,760	
Ammonia price ($/ton):	$176	[Polysius]
Electricity price ($/kWh):	$0.05	[DOE/EIA "Monthly Energy Review," Sept. 2004]
Coal price ($/ton):	$53.67	[DOE/EIA "Quarterly Coal Consumption and Quality Report--Mfg Plants," 10/4/04]
Annual interest rate (REAL,fractional):	0.07	[OMB Circular, 1992]
Control equipment life (years):	20.0	[engineering judgment]
Capital recovery factor:	0.0944	[calculated]

Costs:		
Operating Labor	$75,000	2000 man-hr $37.5 /man-hr
Supervisory	$11,250	15% of Operating Costs, EPA, Control Cost Manual
Maintenance Labor:	$37,500	1000 man-hr $37.5 /man-hr
Maintenance Materials:	$37,500	100% of Maintenance Labor, EPA, Control Cost Manual
Catalyst Replacement	$602,912	67 % of equip cost = (Cost + Taxes + Freight) * CRF, CRF = 0.3813 (catalyst life = 3 years, i = 7%)
Ammonia	$358,596	[calculated]
Electricity:	$7,641	[calculated]
Supplemental coal:	$9,795	[calculated - kiln thermal efficiency reduction attributable to NOx controls]
Reheater Fuel	$5,849,928	$7.50 /decatherm 89 MMBtu/hr (reheat from 350 to 750 °F)*
Overhead	$96,750	60% % total labor and maintenance materials, EPA, Control Cost Manual
Taxes, insurance, & administration:	$185,311	4% of TCI, EPA, Control Cost Manual
Capital recovery:	$437,300	9.44 % of TCI, EPA, Control Cost Manual
TOTAL ANNUAL COST:	$7,709,482	[calculated]

AVG. COST-EFFECTIVENESS ($/ton NOx): $15,087 [calculated] Tons removed = 511

INCREMENTAL COST-EFFECTIVENESS OVER SNCR ($/ton NOx) $52,916 [calculated]

NOTE: [1] Source of each number appears in brackets.

*Reheat calculation:

324,000	acf	530	scf	0.070	lb	0 25	Btu	60	min			400	°F rise	=	89 MMBtu/
	min	810	acf		scf		lb-°F		hr	1E+06	Btu				hr

Appendix C-3

Rinker Brooksville Plant Unit II:
Cost Estimates for SO_2 Control
(Technology 1)

Appendix C-3

Rinker Brooksville Plant Unit II: Cost Estimates for SO_2 Control

(Technology 1: Dry Injection of Hydrated Lime into Preheat Tower)

	SO_2 Control Device When Operating		Time-Weighted Facility Averages		
	Raw Mill	Dry Injection	w/o Dry Injection	with Dry Injection	Source/Explanation
Gas Stream and Performance Parameters					
-- Operating time as % of calendar year	85%	15%	100%	100%	
-- Precalciner capacity (tons clinker/day)	2,800	2,800	2,800	2,800	[Rinker]
--Uncontrolled emission (lb/ton clinker)	0.372	0.372	0.372	0.372	[Polysius]
--Uncontrolled emission (ton/day)	0.521	0.521	0.521	0.521	[Calculated]
-- Uncontrolled emission (ton/yr):	162	28.5	190	190	[Calculated]
-- Control efficiency (%):	45%	45%	38.3%	45.0%	[Calculated]
-- Controlled SO_2 (lb/ton clinker):	0.205	0.205	0.230	0.205	[Polysius]
-- Controlled SO_2 (ton/yr):	89.0	15.7	118	105	[Calculated]
-- SO_2 removed (ton/yr):	72.8	12.8	72.8	85.6	[Calculated]
-- Flue gas flow, pre-baghouse (acfm):	324,000	324,000	324,000	324,000	[Polysius]
-- Hydrated lime requirement (tons/day):	0	0.90			[Calculated @ 1.5 stoich. ratio to uncontr. SO_2]
-- Electricity - I. D. fan pressure loss (kW)	Base	190			[Calculated @ 3.0 in. w.c. loss in dry injection tower]
Direct Capital Costs					
Equipment Costs	Base	$300,000			RTP Estimate
Instrumentation & Ancillary Equip.	Base	Included			RTP Estimate
Taxes 6%	Base	$18,000			State Sales Tax
Freight 5%	Base	$15,000			EPA, Control Cost Manual, % of Equipment Cost
Total Direct Capital Costs:	Base	$333,000			
Direct Installation Costs					
Foundation and Supports	Base	$39,960			12% of TDCC, EPA, Control Cost Manual
Handling and Erection	Base	$133,200			40% of TDCC, EPA, Control Cost Manual
Electrical	Base	$3,330			1% of TDCC, EPA, Control Cost Manual
Piping	Base	$99,900			30% of TDCC, EPA, Control Cost Manual
Painting	Base	$3,330			1% of TDCC, EPA, Control Cost Manual
Site Prep	Base	$20,000			Engineering Estimate
Buildings	Base	$25,000			Engineering Estimate
Total Direct Installation Costs:	Base	$324,720			
Indirect Costs					
Engineering	Base	$33,300			10% of TDCC, EPA, Control Cost Manual
Construction and Field Expenses	Base	$33,300			10% of TDCC, EPA, Control Cost Manual
Contractor Fees	Base	$33,300			10% of TDCC, EPA, Control Cost Manual
Startup & Performance Test	Base	$6,660			2% of TDCC, EPA, Control Cost Manual
Contingencies	Base	$9,990			3% of TDCC, EPA, Control Cost Manual
Total Indirect Costs:	Base	$116,550			
Total Capital Investment (TCI)	Base	$774,270	Base	$774,270	
ANNUAL COSTS					
Inputs:					
Operating factor (hours/year):	7,446	1,314	8,760	8,760	
Hydrated lime price ($/ton):	$100	$100			[Polysius]
Electricity price ($/kWh):	$0.05	$0.05			[DOE/EIA "Monthly Energy Review," Sept. 2004]
Annual interest rate (REAL,fractional):	0.07	0.07			[OMB Circular, 1992]
Control equipment life (years):	20.0	20.0			[Engineering Judgment]
Capital recovery factor:	0.0944	0.0944			[Calculated]
Costs:					
Operating Labor	Base	$20,625			550 man-hr $37.5 /man-hr
Supervisory	Base	$3,094			15% of Operating Costs, EPA, Control Cost Manual
Maintenance Labor:	Base	$20,625			550 man-hr $37.5 /man-hr
Maintenance Materials:	Base	$20,625			100% of Maintenance Labor, EPA, Control Cost Manual
Hydrated Lime	Base	$4,953			[Calculated]
Electricity:	Base	$12,480			[Calculated]
Overhead	Base	$38,981			60% % total labor & maint. mat'ls, EPA, Control Cost Manual
Taxes, insurance, & administration:	Base	$30,971			4% of TCI, EPA, Control Cost Manual
Capital recovery:	Base	$73,086			9.44% of TCI, EPA, Control Cost Manual
TOTAL ANNUAL COST:	**Base**	**$225,439**	**Base**	**$225,439**	[Calculated]

AVG. & INCR. COST-EFFECTIVENESS ($/ton SO_2): $17,547 Annual tons removed by dry lime injection tower = 12.8

"Raw Mill" = SO_2 controlled via gas contact with alkaline raw materials in raw mill. "Tower" = Raw mill bypassed; SO_2 controlled via hydrated lime dry injection tower.

Appendix C-4

Rinker Brooksville Plant Unit II:
Cost Estimates for SO_2 Control
(Technology 2)

Appendix C-4

Rinker Brooksville Plant Unit II: Cost Estimates for SO_2 Control

(Technology 2: Dry Injection of Hydrated Lime into Vendor-Supplied Dry Injection Tower)

	SO_2 Control Device When Operating		Time-Weighted Facility Averages		
	Raw Mill	Dry Injection	w/o Dry Injection	with Dry Injection	
Gas Stream and Performance Parameters					
-- Operating time as % of calendar year	85%	15%	100%	100%	
-- Precalciner capacity (tons clinker/day)	2,800	2,800	2,800	2,800	[Rinker]
--Uncontrolled emission (lb/ton clinker)	0.372	0.372	0.372	0.372	[Polysius]
--Uncontrolled emission (ton/day)	0.521	0.521	0.521	0.521	[Calculated]
-- Uncontrolled emission (ton/yr):	162	28.5	190	190	[Calculated]
-- Control efficiency (%):	45%	45%	38.3%	45.0%	[Calculated]
-- Controlled SO_2 (lb/ton clinker):	0.205	0.205	0.230	0.205	[Polysius]
-- Controlled SO_2 (ton/yr):	89.0	15.7	118	105	[Calculated]
-- SO_2 removed (ton/yr):	72.8	12.8	72.8	85.6	[Calculated]
-- Flue gas flow, pre-baghouse (acfm):	324,000	324,000	324,000	324,000	[Polysius]
-- Hydrated lime requirement (tons/day):	0	0.90			[Calculated @ 1.5 stoich. ratio to uncontr. SO_2]
-- Electricity - I. D. fan pressure loss (kW)	Base	190			[Calculated @ 3.0 in. w c. across dry injection tower]
Direct Capital Costs					
Equipment Costs	Base	$405,000			Vendor Estimate (WAPC)
Instrumentation & Ancillary Equip.	Base	$150,000			Vendor Estimate (WAPC)
Taxes 6%	Base	$33,300			State Sales Tax
Freight 5%	Base	$27,750			EPA, Control Cost Manual, % of Equipment Cost
Total Direct Capital Costs:	Base	$616,050			
Direct Installation Costs					
Foundation and Supports	Base	$73,926			12% of TDCC, EPA, Control Cost Manual
Handling and Erection	Base	$246,420			40% of TDCC, EPA, Control Cost Manual
Electrical	Base	$6,161			1% of TDCC, EPA, Control Cost Manual
Piping	Base	$184,815			30% of TDCC, EPA, Control Cost Manual
Painting	Base	$6,161			1% of TDCC, EPA, Control Cost Manual
Site Prep	Base	$40,000			Engineering Estimate
Buildings	Base	$25,000			Engineering Estimate
Total Direct Costs:	Base	$582,482			
Indirect Costs					
Engineering	Base	$61,605			10% of TDCC, EPA, Control Cost Manual
Construction and Field Expenses	Base	$61,605			10% of TDCC, EPA, Control Cost Manual
Contractor Fees	Base	$61,605			10% of TDCC, EPA, Control Cost Manual
Performance Test	Base	$12,321			2% of TDCC, EPA, Control Cost Manual
Contingencies	Base	$18,482			3% of TDCC+TDC, EPA Control Cost Manual
Total Indirect Costs:	Base	$215,618			
Total Capital Investment (TCI)	Base	$1,414,150	Base	$1,414,150	
ANNUAL COSTS					
Inputs:					
Operating factor (hours/year):	7,446	1,314	8,760	8,760	
Hydrated lime price ($/ton):	$100	$100			[Polysius]
Electricity price ($/kWh):	$0.05	$0.05			[DOE/EIA "Monthly Energy Review," Sept. 2004]
Annual interest rate (REAL,fractional):	0.07	0.07			[OMB Circular, 1992]
Control equipment life (years):	20.0	20.0			[Engineering Judgment]
Capital recovery factor:	0.0944	0.0944			[Calculated]
Costs:					
Operating Labor	Base	$20,625			550 man-hr $37.5 /man-hr
Supervisory	Base	$3,094			15% of Operating Costs, EPA, Control Cost Manual
Maintenance Labor:	Base	$20,625			550 man-hr $37.5 /man-hr
Maintenance Materials:	Base	$20,625			100% of Maint. Labor, EPA Control Cost Manual
Hydrated Lime	Base	$4,953			[Calculated]
Electricity:	Base	$12,480			[Calculated]
Overhead	Base	$38,981			60% % total labor and maint. mat'ls, EPA, Control Cost Manual
Taxes, insurance, & administration:	Base	$56,566			4% of TCI, EPA, Control Cost Manual
Capital recovery:	Base	$133,486			9.44 % of TCI, EPA, Control Cost Manual
TOTAL ANNUAL COST:	Base	$311,435	Base	$311,435	[Calculated]

AVG. & INCR. COST-EFFECTIVENESS ($/ton SO_2): **$24,241** Annual tons removed by dry lime injection tower = 12.8

*"Raw Mill" = SO_2 controlled via gas contact with alkaline raw materials in raw mill. "Tower" = Raw mill bypassed; SO_2 controlled via hydrated lime dry injection tower.

Appendix C-5

Rinker Brooksville Plant Unit II:
Cost Estimates for SO_2 Control
(Technology 3)

Appendix C-5

Rinker Brooksville Plant Unit II: Cost Estimates for SO_2 Control

(Technology 3: Vendor-Supplied Spray Dryer Absorption System)

Gas Stream and Performance Parameters

-- Operating time as % of calendar year	100%	[Assumed for Calculation]		
-- Precalciner capacity (tons clinker/day)	2,800	[Rinker]		
--Uncontrolled emiss. (ton/day)	0.322	[Calculated]		
--Uncontrolled Emiss. (lb/ton clinker)	0.23	[Polysius]		
-- Uncontrolled Emiss. at FGD inlet (ton/yr):	118	[Calculated]		
-- FGD control efficiency (%):	70%	[Vendor Estimate]		
-- FGD controlled SO_2 (lb/ton clinker):	0.069	[Polysius]		
-- Controlled SO_2 (ton/yr):	35.3	[Calculated]		
-- SO_2 removed (ton/yr):	82.3	[Calculated]		
-- Flue gas flow, pre-baghouse (acfm):	324,000	[Polysius]		
-- Quicklime requirement (tons/day):	0.423	[Calculated @	1.5	stoichiometric ratio to uncontr. SO_2]
-- Electricity - I. D. fan pressure loss (kW)	380	[Calculated @	6.0	in. w.c. loss across FGD system]

Direct Capital Costs

Equipment Costs		$3,200,000	RTP Estimate; does not include fabric filters (included elsewhere in Polysius cost estimate)
Instrumentation & Ancillary Equip.		Included	RTP Estimate
Taxes	6%	$192,000	State Sales Tax
Freight	5%	$160,000	EPA, Control Cost Manual, % of Equipment Cost
Total Direct Capital Costs:		$3,552,000	

Direct Installation Costs

Foundation and Supports	$426,240	12%	of TDCC, EPA, Control Cost Manual
Handling and Erection	$1,420,800	40%	of TDCC, EPA, Control Cost Manual
Electrical	$35,520	1%	of TDCC, EPA, Control Cost Manual
Piping	$1,065,600	30%	of TDCC, EPA, Control Cost Manual
Painting	$35,520	1%	of TDCC, EPA, Control Cost Manual
Site Prep	$40,000	Engineering Estimate	
Buildings	$25,000	Engineering Estimate	
Total Direct Costs:	$3,048,680		

Indirect Costs

Engineering	$355,200	10%	of TDCC, EPA, Control Cost Manual
Construction and Field Expenses	$355,200	10%	of TDCC, EPA, Control Cost Manual
Contractor Fees	$355,200	10%	of TDCC, EPA, Control Cost Manual
Startup & Performance Test	$71,040	2%	of TDCC, EPA, Control Cost Manual
Contingencies	$106,560	3%	of TDCC+TDC, EPA Control Cost Manual, SCR Section
Total Indirect Costs:	$1,243,200		

Total Capital Investment (TCI) $7,843,880

ANNUAL COSTS

Inputs:

Operating factor (hours/year):	8,760	
Quicklime price ($/ton):	$121	[Feb. 2005 negotiated price Tampa Bay Water]
Electricity price ($/kWh):	$0.05	[DOE/EIA "Monthly Energy Review," Sept. 2004]
Annual interest rate (REAL,fractional):	0.07	[OMB Circular, 1992]
Control equipment life (years):	20.0	[Engineering Judgment]
Capital recovery factor:	0.0944	[Calculated]

Costs:

Operating Labor	$75,000	2,000	man-hr $37.5 /man-hr
Supervisory	$11,250	15%	of Operating Costs, EPA, Control Cost Manual
Maintenance Labor:	$75,000	2,000	man-hr $37.5 /man-hr
Maintenance Materials:	$75,000	100%	of Maintenance Labor, EPA, Control Cost Manual
Hydrated Lime	$18,665	[Calculated]	
Electricity:	$166,404	[Calculated]	
Overhead	$141,750	60%	of total labor & maint. mat'ls, EPA, Control Cost Manual
Taxes, insurance, & administration:	$313,755	4%	of TCI, EPA, Control Cost Manual
Capital recovery:	$740,407	9.44	% of TCI, EPA, Control Cost Manual
TOTAL ANNUAL COST:	$1,617,231	[Calculated]	

AVG. COST-EFFECTIVENESS ($/ton SO_2): **$19,657** Ton/yr SO_2 removed = 82

Appendix C-6

Rinker Brooksville Plant Unit II:
Cost Estimates for SO_2 Control
(Technology 4)

Appendix C-6

Rinker Brooksville Plant Unit II: Cost Estimates for SO_2 Control

(Technology 4: Wet Limestone Flue Gas Desulfurization System)

Gas Stream and Performance Parameters				
-- Operating time as % of calendar year	100%	[Assumed for Calculation]		
-- Precalciner capacity (tons clinker/day)	2,800	[Rinker]		
--Uncontrolled emiss. (ton/day)	0.322	[Calculated]		
--Uncontrolled Emiss. (lb/ton clinker)	0.23	[Calculated]		
-- Uncontrolled Emiss. at FGD inlet (ton/yr):	118	[Calculated]		
-- FGD control efficiency (%):	95%	[vendor estimate]		
-- FGD controlled SO_2 (lb/ton clinker):	0.012	[Calculated]		
-- Controlled SO_2 (ton/yr):	5.88	[Calculated]		
-- SO_2 removed (ton/yr):	112	[Calculated]		
-- Flue gas flow (acfm):	324,000	[Polysius]		
-- Limestone requirement (tons/day):	0.50	[Calculated @	1.0	stoichiometric ratio to uncontr. SO_2]
--FGD byproduct; $CaSO_4 \cdot 2H_2O$/water (ton/yr)	442	[Calculated]		
-- Electricity - I. D. fan pressure loss (kW)	380	[Calculated @	6.0	in. w.c. loss across FGD system]

Direct Capital Costs			
Equipment Costs		$6,000,000	RTP Estimate
Instrumentation & Ancillary Equip.		Included	RTP Estimate
Taxes	6%	$360,000	State Sales Tax
Freight	5%	$300,000	EPA, Control Cost Manual, % of Equipment Cost
Total Direct Capital Costs:		$6,660,000	

Direct Installation Costs			
Foundation and Supports	$799,200	12%	of TDCC, EPA, Control Cost Manual
Handling and Erection	$2,664,000	40%	of TDCC, EPA, Control Cost Manual
Electrical	$66,600	1%	of TDCC, EPA, Control Cost Manual
Piping	$1,998,000	30%	of TDCC, EPA, Control Cost Manual
Painting	$66,600	1%	of TDCC, EPA, Control Cost Manual
Site Prep	$100,000	Engineering Estimate	
Buildings	$100,000	Engineering Estimate	
Total Direct Costs:	$5,794,400		

Indirect Costs			
Engineering	$666,000	10%	of TDCC, EPA, Control Cost Manual
Construction and Field Expenses	$666,000	10%	of TDCC, EPA, Control Cost Manual
Contractor Fees	$666,000	10%	of TDCC, EPA, Control Cost Manual
Startup & Performance Test	$133,200	2%	of TDCC, EPA, Control Cost Manual
Contingencies	$199,800	3%	of TDCC+TDC, EPA Control Cost Manual, SCR Section
Total Indirect Costs:	$2,331,000		
Total Capital Investment (TCI)	$14,785,400		

ANNUAL COSTS

Inputs:		
Operating factor (hours/year):	8,760	
Limestone price ($/ton):	$25	[RTP Estimate]
Wet sludge byproduct disposal ($/ton)	$15	[RTP Estimate]
Electricity price ($/kWh):	$0.05	[DOE/EIA "Monthly Energy Review," Sept. 2004]
Annual interest rate (REAL,fractional):	0.07	[OMB Circular, 1992]
Control equipment life (years):	20.0	[engineering judgment]
Capital recovery factor:	0.0944	[Calculated]

Costs:			
Operating Labor	$150,000	4,000	man-hr $37.5 /man-hr
Supervisory	$22,500	15%	of Operating Costs, EPA, Control Cost Manual
Maintenance Labor:	$150,000	4,000	man-hr $37.5 /man-hr
Maintenance Materials:	$150,000	100%	of Maintenance Labor, EPA, Control Cost Manual
Limestone	$4,591	[Calculated]	
Wet sludge byproduct disposal	$6,628	[Calculated]	
Electricity:	$166,404	[Calculated]	
Overhead	$283,500	60%	% total labor and maint. mat'ls, EPA, Control Cost Manual
Taxes, insurance, & administration:	$591,416	4%	of TCI, EPA, Control Cost Manual
Capital recovery:	$1,395,637	9.44	% of TCI, EPA, Control Cost Manual
TOTAL ANNUAL COST:	**$2,920,676**	[Calculated]	
AVG. COST-EFFECTIVENESS ($/ton SO_2):	**$26,158**		Ton/yr SO_2 removed = 112

Attachment B

Letters from Polysius Corp. Regarding Kiln Maximum Design Capacity and Heat Input

Polysius Corp.

A **ThyssenKrupp** Technologies Company

180 Interstate North Parkway
Atlanta, Georgia 30339-2194
Phone: (770) 955-3660 Fax: (770) 955-8789

Mark S. Terry
President

December 14, 2004

Rinker Materials Corporation
1501 Belevedere Road
West Palm Beach, Florida 33406

Attention: Mr. Charles Allen
Vice President Cement

Dear Charles:

Pursuant to our telecon yesterday, I would like to address your concerns regarding the maximum design capacity of the proposed new line at your Brooksville facility. At Polysius, we are quite conservative in our system sizing and design. This is essential in our business as we must achieve our guaranteed figures quickly. As you are well aware, we must achieve several values at the rated capacity; i.e. power, heat consumption, etc. This leaves further system reserve which is inevitably exploited by our clientele once we have handed over the facility. In fact, our clients often produce up to 20% above our guaranteed capacity within five years of takeover. By optimizing mix designs, fuel specifics and operating parameters, your plant personnel should be able to process as much as 3,000 stpd clinker (5,000 stpd raw feed) through the new line. Sustainability and product quality will be your primary concerns at the higher capacities, especially as you approach the 3,000 stpd mark.

With regard to the main equipment, you are mechanically protected at these higher throughput rates. Structurally, the preheater tower is designed for catastrophic process conditions, whereby the normal cyclone loads are considered, plus the possible plugging of the largest cyclone. Your system is also protected by gamma level detectors in the lower stages. The cyclones and gas ducts themselves are designed for low pressure drop at nominal capacity so you will have to relinquish that benefit in order to force more material and gas flow through these vessels. The same applies somewhat to the calciner, but to a lesser extent. In the calciner, the concern is more related to the maximum thermal load in that reactor. The calciner is designed to handle, albeit as a maximum, the maximum heat input from the fuel system. That work that cannot be completed in the calciner is handled by the kiln anyway, which is good news. Since you have a two-support, conventional roller station kiln, the diameter is generous in relation to the length; thus the cross-sectional thermal load will still be well within acceptable limits at maximum throughput.

Mechanically, the kiln is stout enough to handle up to a 10% fill level in the inlet zone and up to 15% in the hotter sections. Of course, this is a function of density and kiln speed (revolutions/min.), but you have ample flexibility in that drive arrangement to achieve kiln speeds in excess of 4.0 rpm, if need be.

The clinker cooler is also mechanically capable of handling 3,000 stpd clinker throughput, but even with the extra reserve in the cooling air fans you will have to contend with elevated outlet temperatures. The specific grate loading is quite high at maximum production rates.

As previously mentioned, sustainability and product quality will be your primary concerns at maximum throughput rates. Initially, we feel that 3,000 stpd clinker (approximately 205-209 stph preheater feed rates) should be seen as your short-term maximum – for periods of an hour or so. 2,850 stpd clinker should be sustainable for periods of approximately three hours. 2,800 stpd clinker is a reasonable goal for your 24-hour "catch-up period", when you come up after an unplanned outage.

Based on my experience in working with you in the past, and having seen what you have done at the plants in Brooksville and Miami, I suspect that you will find a way to accomplish these objectives much sooner than we expect. Given the flexibility of our system there are numerous ways for you to optimize your mix, fuels, operation and plant availability to sustain these higher production rates over the long term.

Should you have any further questions regard this or any other matter, please contact me directly.

Best regards,

POLYSIUS CORP.

Mark S. Terry
President

MT/pw

Polysius Corp.
A **ThyssenKrupp** Technologies Company

180 Interstate North Parkway
Atlanta, Georgia 30339-2194
Phone: (770) 955-3660 Fax: (770) 955-8789

January 06, 2005

Rinker Materials Corporation
1501 Belevedere Road
West Palm Beach, Florida 33406

Attention: Mr. Charles Allen
Director of Operation

Dear Charles,

Further to Polysius Corp's. statement, dated December 14, 2004, regarding request for additional information on Permit Processing, the following clarification can be made:

For processing maximum amount of clinker of 3000 stph through the new line it will be required to handle about 206 -210 stph dry feed (less then 1% moisture). This corresponds to Raw material to clinker ratio from 1.65 to 1.66.

Regarding the heat input for the Kiln and the Calciner burner it will be required to burn the equivalent of 15 stph of coal total for the system. To maintain the split between the kiln and Calciner burner of 50/50 each firing point will be processed 7.5 stph into the system.

Sincerely Yours,

Oleg

Oleg Geskin

Pyro Process Operation

Attachment C

Typical Raw Materials and Fuels Analyses

Raw Materials for New Rinker
Cement Plant
1/20/05

	High Rock	Low Rock	Bauxite	Mill Scale
SiO2	3.70	10.72	4.70	1.59
Al2O3	0.41	0.56	53.03	0.32
Fe2O3	0.20	0.24	11.22	95.89
CaO	50.88	45.72	0.17	0.75
MgO	0.16	0.21	0.09	0.17
SO3	0.10	0.08	0.10	0.11
Na2O	0.01	0.01	0.01	0.05
K2O	0.06	0.09	0.05	0.01
TIO2	0.03	0.04	0.72	0.03
P2O5	0.05	0.07	0.04	0.04
Mn2O3	0.02	0.02	0.05	0.74
Cl	0.00	0.00	0.00	0.00
LOI / GOI	43.38	41.37	28.63	-2.33

Proposed Fuel for New Kiln

Ultimate Analysis of Coal

	% Dry Basis
Ash	7.87
Hydrogen	5.45
Carbon	80.36
Nitrogen	1.45
Sulfur	0.71
Oxygen	4.16

Proximate Analysis of Coal

	As Rec'd	Dry Basis
Moisture	8.00	
Ash	7.24	7.87
Volatile	31.91	34.68
Fixed Carbon	52.85	57.45
Total	100.00	100.00

Condition F.11 from Title V Permit 0530021-007-AV regarding the use of "On-Specification" used oil:

The burning of "on-specification" used oil is allowed at this facility in accordance with all other conditions of this permit and the following additional conditions:

a. Only "on-specification" used oil generated at the Florida Crushed Stone Company's Gregg Mine and the Central Power and Lime Plant can be blended with the purchased fuel oil, which is to be used only as a startup fuel for preheating the cement kiln I. "On-specification" used oil is defined as each used oil delivery that meets the 40 CFR 279 (Standards for the Management of Used Oil) specifications listed below. Used oil that does not meet all of the following specifications is considered "off-specification" oil and shall not be fired.

Constituent/Property*	Allowable Level
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Total Halogens	1000 ppm maximum
Flash point	140 °F minimum

* As determined by approved methods specified in EPA Publication SW-846 (Test Methods for Evaluating Solid Waste, Physical/Chemical Methods).

b. Permittee agrees that the used oil to be blended and burned at the facility shall not be a hazardous waste as defined in Rule 62-210.200, F.A.C., or 40 CFR Part 261, and will not include fuels or blended fuels consisting in whole or part of hazardous waste or which include mixtures of any solid waste generated from the treatment, storage, or disposal or hazardous waste, and such burning shall be in compliance with Section 403.769(3), F.S.

Attachment D

Existing Startup, Shutdown, and Malfunction Plan

FCS FLORIDA CRUSHED STONE COMPANY

BROOKSVILLE CEMENT PLANT

OPERATION & MAINTENANCE PLAN
STARTUP, SHUTDOWN & MALFUNCTION PLAN

INITIAL PLAN PREPARATION DATE: March 3, 2005
PLAN REVISION NUMBER & DATE: REV. 0, March 3, 2005

Table of Contents

Attachments

This plan provides Standard Operating Procedures (SOP), maintenance schedules, maintenance checklists, monitoring procedures, monitoring schedules, and corrective actions in attachments to the plan.

Introduction

The National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry (40 CFR 63, Subpart LLL) require the owner or operator of each Portland cement plant to prepare for each affected source a written operations and maintenance plan. The plan must include the following information:

(1) Procedures for proper operation and maintenance of the affected source and air pollution control devices in order to meet the emission limits and operating limits of 40 CFR 63.1343 through 63.1348;

(2) Corrective actions to be taken when required by paragraph 40 CFR 63.1350(e);

(3) Procedures to be used during an inspection of the components of the combustion system of each in-line kiln and raw mill located at the facility at least once per year; and

(4) Procedures to be used to periodically monitor affected sources subject to opacity standards under 40 CFR 63.1346 and 63.1348.

The affected sources covered by this plan are designated by 40 CFR 63.1340:

(1) Each in-line kiln/raw mill
(2) Each clinker cooler
(3) Each raw mill
(4) Each finish mill
(5) Each raw material dryer
(6) Each raw material, clinker, or finished product storage bin
(7) Each conveying system transfer point
(8) Each bagging system; and
(9) Each bulk loading or unloading system.

The affected sources and air pollution control devices are specifically described by the Florida Department of Environmental Protection Title V Air Permit No. 0530021-002-AV.

Brooksville Cement Plant I	
E.U. ID No./Facility ID No.	Brief Description
-001/D-75	Filter Dust Bin with Baghouse
-002/D-67	Fly Ash/Equilibrium Catalyst Bin with Baghouse
-004/F-14	Raw Meal Transfer with Baghouse
-006/G-12A & B	Two Blend Silos with Baghouse
-007/H-15	Kiln Feed Surge Bin with Baghouse
-008/S-04	Clinker Receiving/Handling System
-010/L-06 & L-07	Clinker Storage Silo and Finish Mill Storage Silo with Baghouse
-011/L-08	Gypsum and Limestone Bins with Baghouse
-012/M-08	Silo Discharge with Baghouse
No ID/L-03	Clinker Cooler Discharge with Baghouse
-013/N-13	Finish Mill with Baghouse
-014/Q-17	Cement Storage Silos #1 & #2 Discharge System with Baghouse
-015/Q-15	Cement Storage Silos #1 & #2 with Baghouse
-017/D-63	Iron Ore Bin with Baghouse
-019/M-05	Finish Mill Feed Belt with Baghouse
-020/	In-Line Kiln I/Raw Mill and Clinker Cooler I with Baghouse
-021/Z-17	Cement Storage Silo #3 Discharge System with Baghouse
-022/Z-15	Cement Storage Silo #3 with Baghouse
-023/	Cement Storage Silo #4 and Truck Loadout System with Baghouse
-024/Z-18	Cement Storage Silo and Railcar Loadout System with Baghouses

This plan provides Standard Operating Procedures (SOP), maintenance schedules, maintenance checklists, monitoring procedures, monitoring schedules, and corrective actions. This plan also provides a Startup, Shutdown and Malfunction plan, as required by 40 CFR 63.6.

Procedures for Proper Operation and Maintenance of the Affected Source and Air Pollution Control Devices

This section provides procedures for proper operation and maintenance of the affected sources and air pollution control devices in order to meet the emission limits and operating limits of 40 CFR 63.1343 through 63.1348.

At all times, including periods of startup, shutdown, and malfunction, owners or operators shall operate and maintain any affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by all relevant standards.

Appropriate parameters of processing or materials handling systems provide a measure of the rate of operations. The operation and maintenance plan includes performance parameters which indicate the rate of operation, process weight throughput, the fuel or other energy source, the materials being processed or other physical or chemical characteristics, as applicable.

The plan includes schedules for the maintenance and inspection of each control device and collection system and a schedule for recording performance parameters of the control devices, collection systems and auxiliary equipment. The performance parameters include such physical, chemical or electrical characteristics as are applicable to the particular emissions unit and which are indicators of the condition, operating rates and efficiencies. The plan contains inspection and maintenance schedules including periodic assessments of the condition of manholes, ducting, breaching, hoods, conveyor and elevator housings, loading sheds and other equipment. Records of inspections, maintenance and performance data of control devices and auxiliary equipment shall be retained by the emissions unit for a minimum of five years and shall be made available to the Department upon request.

Safety is a critical component of plant operation and maintenance, and is not specifically addressed in this plan. Existing site-specific safety procedures supersede any general guidance within this plan.

EU 001/D-75 Filter Dust Bin with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is a storage bin for fines (dust). Dust from the kiln is collected and either:

1. recycled into the kiln to produce clinker,
2. used as an additive in the production of special cement products, or
3. sold to third parties as a waste stabilizer.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	45 TPH
Process temperature or pressure	475 deg. F (max)
Chemical or physical data on product or raw materials	Filter dust

The material is transferred to the elevated storage bin pneumatically. From the elevated bin, the material is fed by gravity or screw conveyor. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The level of the material in the bin is measured daily to prevent overfilling. When the bin level approaches full, filling is stopped by the control room operator.

Maintenance of Affected Source

Bins are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a bin for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Bins with supports and/or walls that show any signs of having been over-stressed during previous use, or that have been badly deteriorated by corrosion, should be repaired before further use. Deteriorated doors and door frames shall be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the bin's life. At least annually, a thorough inspection of the entire structure is performed, and repairs are made where necessary.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	D-75
Type of control device	Baghouse
Stack height	125 feet
Exit diameter	2.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	6800 acfm
Maximum dry standard flow rate	6686 dscfm
Gas temperature	77° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 002/D-67 Fly Ash/Equilibrium Catalyst Bin with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is a storage bin for fly ash/equilibrium catalyst.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	25 TPH
Process temperature or pressure	Ambient
Chemical or physical data on product or raw materials	Fly ash/Equilibrium catalyst

The material is transferred to the elevated storage bin pneumatically. From the elevated bin, the material is fed by gravity or screw conveyor. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The level of the material in the bin is measured at least daily to prevent overfilling. When the level of the material in the bin approaches full, filling is stopped by the control room operator.

Maintenance of Affected Source

Bins are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a bin for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Bins with supports and/or walls that show any signs of having been over-stressed during previous use, or that have been badly deteriorated by corrosion, should be repaired before further use. Deteriorated doors and door frames shall be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the bin's life. At least annually, a thorough inspection of the entire structure is performed, and repairs are made where necessary.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	D-67
Type of control device	Baghouse
Stack height	125 feet
Exit diameter	2.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	4200 acfm
Maximum dry standard flow rate	4130 dscfm
Gas temperature	77° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 004/F-14 Raw Meal Transfer with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of raw meal being transferred from the raw mill collection cyclones, to an air lift system.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	138 TPH
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Raw materials

From the raw mill cyclones, the material is fed by air gravity conveyor to an air lift system, which in turn lifts the material to the top of and into the blend silos. This baghouse provides ventilation and dust collection for the air gravity conveyors. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

All conveyor transfer points are totally enclosed. All dust-laden air generated by the material transfer process shall be totally vented to fabric filtering system to meet the emission limits stipulated above.

Maintenance of Affected Source

- ☐ Inspect and repair air gravity conveyor housings to prevent leakage.
- ☐ Inspect and repair vent ducts to dust collector to prevent leakage.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	F-14
Type of control device	Baghouse
Stack height	70 feet
Exit diameter	1.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	1200 acfm
Maximum dry standard flow rate	970 dscfm
Gas temperature	180° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 006/G-12A & B Two Blend Silos with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is two blending silos for the raw meal being transferred from the raw mill.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	138 TPH
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Raw meal

The material is transferred to the silos pneumatically. From the silos, the material is fed by air gravity conveyors. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The silos are equipped with high level probes and associated alarms to warn of overfilling. The high-level indicators are interlocked with the material filling system such that in the event of a silo approaching an overfilling condition, the material filling system will be automatically shut down.

Maintenance of Affected Source

Silos are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a silo for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Deteriorated doors and door frames should be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the silo's life. Silos need periodic inspection and maintenance, such as cleaning. At least annually, a thorough inspection of the entire structure is performed, and repairs are made where necessary.

Storage silos allow cement plants to stockpile inventory until needed. Buildup on the vessel walls, however, can rob plants of the storage capacity in which they have invested. Buildups slow material flow and decrease the "live" capacity of the vessel. Overcoming these flow problems and recovering storage capacity may require silo cleaning.

Several types of equipment can be used for silo cleaning. One of these operates like an industrial-strength "weed whip," rotating a set of "flails" against the material in the

vessel. The cleaning head is typically inserted through the access port down into the vessel on a pivoting arm.

Any clean-out activity must be carefully controlled to avoid damage to the inner wall, which can reduce flow and cause continuing problems. Steel chain is commonly used for Portland cement or any compacted material where there is no risk of explosion. Nonsparking brass chain is effective for compacted materials where the risk of fire or explosion is present.

Before the cleaning process is initiated, a path for loosened material to leave the vessel must be secured, and the discharge opening must be clear. A transport mechanism at the bottom — a conveyor, a truck, or a loader — is required to avoid buildup below the discharge and blockage of the opening as large quantities of material are removed. In cleaning a plugged silo, the operator starts at the bottom and progresses upward. Wall accumulations are undercut until they fall by their own weight.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	G-12
Type of control device	Baghouse
Stack height	240 feet
Exit diameter	3.5 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	17,000 acfm
Maximum dry standard flow rate	13,745 dscfm
Gas temperature	180° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 007/H-15 Kiln Feed Surge Bin with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of raw meal being transferred from the kiln feed storage silos to the kiln feed surge bin, and then on to the kiln preheater.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	138 TPH
Process temperature or pressure	Ambient
Chemical or physical data on product or raw materials	Kiln feed

The material is transferred to the elevated kiln feed surge bin by air gravity conveyor and bucket elevator. From the elevated bin, the material is fed by air gravity conveyor, to an air lift system, which lifts the material pneumatically to the kiln preheater. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The bin is equipped with load cells that continually weigh the bin and its contents. If the bin reaches a high level, an alarm flashes and the filling control valves close automatically. This prevents overfilling.

Maintenance of Affected Source

Bins are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a bin for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Bins with supports and/or walls that show any signs of having been over-stressed during previous use, or that have been badly deteriorated by corrosion, shall be repaired before further use. Deteriorated doors and door frames shall be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the bin's life. At least annually, a thorough inspection of the entire structure is to be performed, and repairs are to be made where necessary.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a medium temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	H-15
Type of control device	Baghouse
Stack height	50 feet
Exit diameter	2.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	6000 acfm
Maximum dry standard flow rate	4704 dscfm
Gas temperature	200° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 008/S-04 Clinker Receiving/Handling System

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an integrated system for handling clinker that includes a below-grade truck unloading hopper, a belt conveyor, and a deep-bucket conveyor. The fugitive particulate matter emissions generated from the transfer of clinker from the receiving hopper to the belt conveyor are controlled using a Johnson-Marsh Dust Suppressant system, which uses a non-ionic wetting agent or water, as necessary, to enhance the wettability of the clinker.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	100 TPH
Process temperature or pressure	Ambient
Chemical or physical data on product or raw materials	Clinker

The loading, unloading, handling, transfer or storage of clinker, which may generate airborne dust emissions, will be carried out in such a manner to prevent or minimize dust emissions. The materials mentioned above shall be adequately wetted prior to and during the loading, unloading and handling operations. Manual or automatic water spraying system shall be provided at all unloading areas, stock piles and material discharge points.

Openings for the passage of conveyors are fitted with adequate flexible seals. Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface. Conveyors are arranged to minimize free fall as far as practicable. All receiving hoppers for unloading materials shall be enclosed on three sides above the unloading point. The belt conveyors for handling materials shall be enclosed on top and 2 sides with to eliminate any dust emission due to wind erosion.

Maintenance of Affected Source

- ☐ Inspect and adjust all belt conveyors and their skirting rubber and dust seals
- ☐ Inspect belt covers and repair or replace as required
- ☐ Replace torn or defective conveyor belts to prevent leakage
- ☐ Inspect belt scrapers on belt conveyors and adjust, replace worn-out components

Operation of Air Pollution Control Device

An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a wet suppression system. The system is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started.

The spray discharge should be proportional with dust emission. The Dust Suppression System is meant to suppress the dust generated during transfer at feed/discharge points of conveyors. Wetting Agents are chemicals that are added to water to improve the rate at which spray droplets wet dust particles.

This system consists of three main parts.
1. Proportioner units.
2. Spray headers with pipe lines & pumping system.
3. Control units with electrical systems.

Proportioner units include a feed water pump, metering pump, feed water tank, and solutions tanks. The water required for the system is supplied by a feed water pump. The wetting agent, which is in liquid form, is dosed by metering pump as per requirement. Spray headers with pipe lines are provided. The pumping system includes solution pumps, isolating valves, spray nozzles, and pipe lines. The solution pumps are used to supply pressurized water to spray headers. The required quantities of nozzles are used to spray water. Control units with electrical systems consist of sensing units and control panels. The control panels consist of various relays and transformers.

Auto control or manual control governs the system. The water is pumped and at the same time the metering pump doses the proper quantity of chemical. Its inherent design features also make it extremely reliable from a maintenance standpoint. The nozzles have no moving parts.

OPERATIONAL PARAMETERS FOR WET SUPPRESSION

Identification of control device	S-04
Type of control device	Wet suppression
Manufacturer	Johnson-Marsh
Type of chemical used	Water or dust suppressant
Frequency of application	Continuous when operating
Schedule for maintenance and inspection	Semiannually

Maintenance of Air Pollution Control Device

- ☐ Check proportioner units.
- ☐ Check spray headers with pipe lines & pumping system.
- ☐ Check control units with electrical systems.
- ☐ Check solutions tanks.
- ☐ Check feed water supply.
- ☐ Check spray nozzles
- ☐ Check nozzles and system components for wear and corrosion.

EU 010/L-06 & L-07 Clinker Storage Silo and Finish Mill Storage Silo with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of clinker being transferred into the clinker storage silos.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	83 TPH
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Clinker

The material is transferred to the silos by a deep bucket conveyor. From the silos, the material is fed by gravity to belt conveyors. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to a fabric filtering system to meet the emission limits stipulated above.

The silos are measured at least daily to prevent overfilling. If the manual measurements indicate overfilling is imminent, measures are taken by the operations group to prevent overfilling.

Maintenance of Affected Source

Silos are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a silo for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Deteriorated doors and door frames shall be repaired to prevent possible air leakage. Regular maintenance will help extend the silo's life. Silos need periodic inspection and maintenance, such as cleaning. At least annually, a thorough inspection of the entire structure is performed, and repairs are made where necessary.

Storage silos allow cement plants to stockpile inventory until needed. Buildup on the vessel walls, however, can rob plants of the storage capacity in which they have invested. Buildups slow material flow and decrease the "live" capacity of the vessel. Overcoming these flow problems and recovering storage capacity may require silo cleaning.

Several types of equipment can be used for silo cleaning. One of these operates like an industrial-strength "weed whip," rotating a set of "flails" against the material in the

vessel. The cleaning head is typically inserted through the access port down into the vessel on a pivoting arm.

Any clean-out activity must be carefully controlled to avoid damage to the inner wall, which can reduce flow and cause continuing problems. Steel chain is commonly used for cement or any compacted material where there is no risk of explosion. Nonsparking brass chain is effective for compacted materials where the risk of fire or explosion is present.

Before the cleaning process is initiated, a path for loosened material to leave the vessel must be secured, and the discharge opening must be clear. A transport mechanism at the bottom — a conveyor, a truck, or a loader — is required to avoid buildup below the discharge and blockage of the opening as large quantities of material are removed. In cleaning, the operator starts at the bottom and progresses upward. Wall accumulations are undercut until they fall by their own weight.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a medium temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	L-06/L-07
Type of control device	Baghouse
Stack height	200 feet
Exit diameter	1.5 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	2600 acfm
Maximum dry standard flow rate	2038 dscfm
Gas temperature	200° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 011/L-08 Gypsum and Limestone Bins with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of gypsum and limestone being stored and transferred.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	75 TPH
Process temperature or pressure	Ambient
Chemical or physical data on product or raw materials	Gypsum & limestone

The material is transferred to the elevated storage bins mechanically by bucket elevator and belt conveyor. From the elevated bin, the material is fed by gravity onto belt feeders. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The bins are measured at least daily and the inventory levels controlled by the control room operator to prevent overfilling.

Maintenance of Affected Source

Bins are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a bin for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Bins with supports and/or walls that show any signs of having been over-stressed during previous use, or that have been badly deteriorated by corrosion, should be repaired before further use. Deteriorated doors and door frames shall be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the bin's life. At least annually, a thorough inspection of the entire structure is performed, and repairs are made where necessary.,

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a medium temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	L-08
Type of control device	Baghouse
Stack height	135 feet
Exit diameter	1.5 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	5000 acfm
Maximum dry standard flow rate	3920 dscfm
Gas temperature	200° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 012/M-08 Silo Discharge with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of clinker, gypsum or limestone being transferred from their silos, to the finish mill feed belt.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	122 TPH
Process temperature or pressure	Ambient
Chemical or physical data on product or raw materials	Clinker, gypsum, & limestone

From the silos, the material is fed by gravity onto belt feeders. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

All conveyor transfer points are totally enclosed. Openings for the passage of conveyors are fitted with adequate flexible seals. Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface. Conveyors are arranged to minimize free fall as far as practicable. The opening between the silos and weigh belt of the materials is fully enclosed. All dust-laden air generated by the material transfer process shall be totally vented to fabric filtering system to meet the emission limits stipulated above.

Maintenance of Affected Source

- ☐ Inspect and adjust all belt conveyors and their skirting rubber and dust seals
- ☐ Replace torn or defective conveyor belts to prevent leakage
- ☐ Inspect and repair belt covers and enclosures as required to prevent leakage
- ☐ Inspect belt scrapers on belt conveyors and adjust, replace worn-out components

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	M-08
Type of control device	Baghouse
Stack height	135 feet
Exit diameter	2.5 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	9000 acfm
Maximum dry standard flow rate	8316 dscfm
Gas temperature	100° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU TBA/L-03 Clinker Cooler Discharge with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of clinker being transferred from the clinker cooler.

From the clinker cooler, the clinker is transported by gravity or drag chain conveyor to a deep bucket conveyor. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

All conveyor transfer points are totally enclosed. Openings for the passage of conveyors are fitted with adequate flexible seals. Conveyors are arranged to minimize free fall as far as practicable. All dust-laden air generated by the material transfer process shall be totally vented to fabric filtering system to meet the emission limits stipulated above.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	83 TPH
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Clinker

Maintenance of Affected Source

- ☐ Inspect drag chain housing and deep bucket conveyor covers and repair as required to prevent leakage
- ☐ Inspect material transfer chutes and repair as required to prevent leakage
- ☐ Inspect dust collector vent ducts and repair as required
- ☐ Inspect deep bucket conveyor buckets for holes and repair as required

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a high temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	L-03
Type of control device	Baghouse
Stack height	10 feet
Exit diameter	1.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	5100 acfm
Maximum dry standard flow rate	3717 dscfm
Gas temperature	250° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 013/N-13 Finish Mill with Baghouse

Emission Limits and Operating Limits

The owner or operator of each new or existing raw mill or finish mill shall not cause to be discharged from the mill sweep or air separator air pollution control devices of these affected sources any gases which exhibit opacity in excess of ten percent.
[40 CFR 63.1347]

Operation of Affected Source

The final process stage includes grinding the clinker and gypsum to produce cement. Grinding mills are equipped with alloy steel grinding balls. The ball mill grinds the clinker into the final product, for distribution and packaging. The mill works in a closed circuit with a dynamic separator which separates cement of the required fineness from that which needs further grinding. The coarse fraction is returned to the mill.

The accuracy and reliability of metering and proportioning of the mill feed components by weight is critical for maintaining product quality and the high energy efficiency of a grinding system. The metering and proportioning equipment for the material feed to the mill is belt weigh feeders.

The plant uses a pulse-jet fabric filter with a high-efficiency separator. The cement dust collected by the fabric filter is restored to the system.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	125 TPH
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Clinker, gypsum & limestone

Maintenance of Affected Source

Preventive maintenance provides for more productivity through increased uptime. The mill maintenance program reflects the fact that long lead times are required to procure and deliver materials to the site. A target is to maintain a three-month inventory of wear parts and common failure components on-site, to carry a large inventory of spare parts, and to stock two years of certain mechanical, electrical and instrumentation spares.

The inspection and maintenance program includes periodic assessments of the condition of ducting, hoods, conveyors, elevator housings, and other equipment.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a high temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	N-13
Type of control device	Baghouse
Stack height	70 feet
Exit diameter	5.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	40000 acfm
Maximum dry standard flow rate	30892 dscfm
Gas temperature	210° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 014/Q-17 Cement Storage Silos #1 & #2 Discharge System with Baghouses

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of cement being transferred from silos. This emissions unit includes systems for in-plant distribution to loading areas and to packaging systems.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	300 TPH
Process temperature or pressure	Ambient
Chemical or physical data on product or raw materials	Cement

From the silos, the material is fed by gravity and air gravity conveyors. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

All conveyor transfer points are totally enclosed. All dust-laden air generated by the material transfer process shall be totally vented to fabric filtering system to meet the emission limits stipulated above.

Maintenance of Affected Source

- ☐ Inspect air gravity conveyor housings and repair as required to prevent leakage
- ☐ Inspect loading spouts for holes and repair as required
- ☐ Inspect material transfer chutes for holes and repair as required to prevent leakage
- ☐ Inspect dust collector ducting for holes and repair as required
- ☐ Inspect control valves for holes and seal deterioration and repair as required to prevent leakage
- ☐ Inspect all pneumatic lines for cracks

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	Q-17
Type of control device	Baghouse
Stack height	50 feet
Exit diameter	1.5 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	3200 acfm
Maximum dry standard flow rate	2671 dscfm
Gas temperature	160° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 015/Q-15 Cement Storage Silos #1 & #2 with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of cement being pneumatically transferred to two storage silos from the finish mill.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	125 TPH each
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Cement

The material is transferred to the silos pneumatically. From the silos, the material is fed by gravity to trucks, or pneumatically to railcar loading or to bagging. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The silos are measured at least daily. The control room operator controls the inventory levels to prevent overfilling.

Maintenance of Affected Source

Silos are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a silo for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Deteriorated doors and door frames shall be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the silo's life. Silos need periodic inspection and maintenance, such as cleaning. At least annually, a thorough inspection of the entire structure is performed, and repairs are made where necessary.

Storage silos allow cement plants to stockpile inventory until needed. Buildup on the vessel walls, however, can rob plants of the storage capacity in which they have invested. Buildups slow material flow and decrease the "live" capacity of the vessel. Overcoming these flow problems and recovering storage capacity may require silo cleaning.

Several types of equipment can be used for silo cleaning. One of these operates like an industrial-strength "weed whip," rotating a set of "flails" against the material in the vessel. The cleaning head is typically inserted through the access port down into the vessel on a pivoting arm.

Any clean-out activity must be carefully controlled to avoid damage to the inner wall, which can reduce flow and cause continuing problems. Steel chain is commonly used for cement or any compacted material where there is no risk of explosion. Nonsparking brass chain is effective for compacted materials where the risk of fire or explosion is present.

Before the cleaning process is initiated, a path for loosened material to leave the vessel must be secured, and the discharge opening must be clear. A transport mechanism at the bottom — a conveyor, a truck, or a loader — is required to avoid buildup below the discharge and blockage of the opening as large quantities of material are removed. In cleaning, the operator starts at the bottom and progresses upward. Wall accumulations are undercut until they fall by their own weight.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a medium temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	Q-15
Type of control device	Baghouse
Stack height	200 feet
Exit diameter	2.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	7400 acfm
Maximum dry standard flow rate	5983 dscfm
Gas temperature	180° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 017/D-63 Iron Ore Bin with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of iron ore being stored in a bin.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	100 TPH
Process temperature or pressure	Ambient
Chemical or physical data on product or raw materials	Iron ore

The material is transferred to the elevated storage bin by bucket elevator. From the elevated bin, the material is fed by a belt feeder. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The bin is equipped with a high level probe and a flashing alarm to warn of overfilling. The high-level alarm indicators are interlocked with the material filling line such that in the event of the bin approaching an overfilling condition, an alarm will operate, and the material filling feeder will be stopped.

Maintenance of Affected Source

Bins are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a bin for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Bins with supports and/or walls that show any signs of having been over-stressed during previous use, or that have been badly deteriorated by corrosion, shall be repaired before further use. Deteriorated doors and door frames shall be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the bin's life. At least annually, a thorough inspection of the entire structure is performed, and repairs are made where necessary.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	D-63
Type of control device	Baghouse
Stack height	51 feet
Exit diameter	1.5 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	3600 acfm
Maximum dry standard flow rate	2911 dscfm
Gas temperature	180° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 019/M-05Finish Mill Feed Belt with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of transferring clinker, gypsum and limestone to the finish mill.

The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

All conveyor transfer points are totally enclosed. Openings for the passage of conveyors are fitted with adequate flexible seals. Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface. Conveyors are arranged to minimize free fall as far as practicable. All dust-laden air generated by the material transfer process shall be totally vented to fabric filtering system to meet the emission limits stipulated above.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	120 TPH
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Clinker

Maintenance of Affected Source

- ☐ Inspect and adjust all belt conveyors and their skirting rubber and dust seals
- ☐ Inspect belt conveyor covers and repair as required
- ☐ Replace torn or defective conveyor belts to prevent spillage
- ☐ Inspect material transfer chutes for holes and repair as required to prevent leakage
- ☐ Inspect dust collector vent ducts for holes
- ☐ Inspect belt scrapers on belt conveyors and adjust, replace worn-out components

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	M-05
Type of control device	Baghouse
Stack height	29 feet
Exit diameter	2.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	9000 acfm
Maximum dry standard flow rate	8820 dscfm
Gas temperature	85° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 020/ In-Line Kiln I/Raw Mill and Clinker Cooler I with Baghouse

Emission Limits and Operating Limits

40 CFR 63.1343 Standards for kilns and in-line kiln/raw mills.

(a) *General.* The provisions in this section apply to each kiln, each in-line kiln/raw mill, and any alkali bypass associated with that kiln or in-line kiln/raw mill.

(b) *Existing, reconstructed, or new brownfield/major sources.* No owner or operator of an existing, reconstructed or new brownfield kiln or an existing, reconstructed or new brownfield in-line kiln/raw mill at a facility that is a major source subject to the provisions of this subpart shall cause to be discharged into the atmosphere from these affected sources, any gases which:

(1) Contain particulate matter (PM) in excess of 0.15 kg per Mg (0.30 lb per ton) of feed (dry basis) to the kiln. When there is an alkali bypass associated with a kiln or in-line kiln/raw mill, the combined particulate matter emissions from the kiln or in-line kiln/raw mill and the alkali bypass are subject to this emission limit.

(2) Exhibit opacity greater than 20 percent.

(3) Contain D/F in excess of:

(i) 0.20 ng per dscm (8.7×10^{-11} gr per dscf) (TEQ) corrected to seven percent oxygen; or

(ii) 0.40 ng per dscm (1.7×10^{-10} gr per dscf) (TEQ) corrected to seven percent oxygen, when the average of the performance test run average temperatures at the inlet to the particulate matter control device is 204 deg.C (400 deg.F) or less.

(c) *Greenfield/major sources.* Not applicable at time of initial O&M Plan preparation.

(d) *Existing, reconstructed, or new brownfield/area sources.* Not applicable at time of initial O&M Plan preparation.

(e) *Greenfield/area sources.* Not applicable at time of initial O&M Plan preparation.

40 CFR 63.1344 Operating limits for kilns and in-line kiln/raw mills.

(a) The owner or operator of a kiln subject to a D/F emission limitation under 40 CFR 63.1343 must operate the kiln such that the temperature of the gas at the inlet to the kiln particulate matter control device (PMCD) and alkali bypass PMCD, if applicable, does not exceed the applicable temperature limit specified in paragraph (b) of this section. The owner or operator of an in-line kiln/raw mill subject to a D/F emission limitation under 40 CFR 63.1343 must operate the in-line kiln/raw mill, such that:

(1) When the raw mill of the in-line kiln/raw mill is operating, the applicable temperature limit for the main in-line kiln/raw mill exhaust, specified in paragraph (b) of this section and established during the performance test when the raw mill was operating is not exceeded.

(2) When the raw mill of the in-line kiln/raw mill is not operating, the applicable temperature limit for the main in-line kiln/raw mill exhaust, specified in paragraph (b) of this section and established during the performance test when the raw mill was not operating, is not exceeded.

(3) If the in-line kiln/raw mill is equipped with an alkali bypass, the applicable temperature limit for the alkali bypass, specified in paragraph (b) of this section and established during the performance test when the raw mill was operating, is not exceeded.

(b) The temperature limit for affected sources meeting the limits of paragraph (a) of this section or paragraphs (a)(1) through (a)(3) of this section is determined in accordance with 40 CFR 63.1349(b)(3)(iv).

(c) Carbon injection – Not applicable at time of initial O&M Plan preparation.
(d) Carbon injection – Not applicable at time of initial O&M Plan preparation.
(e) Carbon injection – Not applicable at time of initial O&M Plan preparation.

40 CFR 63.1345 Standards for clinker coolers.

(a) No owner or operator of a new or existing clinker cooler at a facility which is a major source subject to the provisions of this subpart shall cause to be discharged into the atmosphere from the clinker cooler any gases which:

(1) Contain particulate matter in excess of 0.050 kg per Mg (0.10 lb per ton) of feed (dry basis) to the kiln.

(2) Exhibit opacity greater than ten percent.

(b) [Reserved].

40 CFR 63.1347 Standards for raw and finish mills.

The owner or operator of each new or existing raw mill or finish mill at a facility which is a major source subject to the provisions of this subpart shall not cause to be discharged from the mill sweep or air separator air pollution control devices of these affected sources any gases which exhibit opacity in excess of ten percent.

Operation of Affected Source

The cement plant is designed for 1800 tons/day of cement clinker product. The cement kiln I, in-line kiln/raw mill and clinker cooler I share a common baghouse fabric filter system (for particulate matter emissions control) and stack with the power plant. Waste heat from the kiln is used to provide heat to the raw mill and the kiln preheater, which is used to drive off moisture from the materials used for making clinker. The movement of raw materials, recycled materials, and product will be through enclosed transfer systems. All gas streams from the various transfer systems will vent through a single baghouse system into the ambient air. The existing site is zoned for mining, so limestone and clay used in the production of cement will be supplied on site. The kiln is allowed to fire bituminous coal, distillate and residual fuel oil, on-specification used oil, and shredded and whole tires. Continuous monitors are operated for opacity, NOx, SO_2, and O_2.

In addition to meeting environmental standards, kiln burning stability increases such things as the kiln brick life, refractory life, requires less frequent warm-up times and lowers fuel consumption.

The kiln product (clinker) discharges from the kiln into the clinker cooler. Cooled clinker is then discharged into a conveyor system and carried to storage.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	138 TPH: Raw mill 127 TPH: Kiln preheater 83 TPH: Clinker cooler
Process temperature or pressure	>Ambient
Fuel or fuel mixture	bituminous coal, distillate and residual fuel oil, on-specification used oil, and shredded and whole tires
Chemical or physical data on product	Clinker

Maintenance of Affected Source

The kiln is the main machine in the cement manufacturing process. Kiln repair and maintenance are critical components in assuring the efficiency of the cement manufacturing plant. If not maintained properly, kiln run-time will be reduced, causing substantial economic losses. Maintenance procedures performed according to prescribed instructions will significantly improve the performance of the kiln and increase plant efficiency.

Proper kiln maintenance techniques ensure desirable operating efficiency. Alignment and ovality measurements can help prevent breakdowns. Inspection and maintenance of the clinker cooler are also important.

Plant availability is critical in a continuous process such as cement production, and an important part is implementing maintenance based on predictive maintenance information. High kiln availability can impact the stability of auxiliary equipment – shutdowns can have a "domino effect" on auxiliary equipment.

Vibration analysis and monitoring is a part of the preventive maintenance program. Unplanned maintenance on a continuous process line can result in higher costs per ton of clinker. The use of predictive maintenance techniques allows one planned shutdown per year, with four or five minor stops and starts. Vibration analysis identifies potential problems and corrective actions can be initiated to eliminate the influence on the component from other sources, such as imbalance or misalignment.

Mechanical personnel are aware of the importance of setting up a machine within certain criteria to enable a long, trouble-free mechanical life. When setting up a machine after repairs or installation, ensure that imbalance or pulley wobbles are eliminated. Evaluate clinker cooler fans, simple, inexpensive adjustments can lower the overall vibration levels.

Predictive maintenance can reduce the systematic replacement of components, regardless of their condition. Individual job requests are initiated when there is evidence that a component is deteriorating. This information is used to determine a plan of action to carry out repairs at the most convenient time, allowing lead time for planning and ordering of parts, labor resources.

An effective predictive maintenance program looks at the rate of change over a period of time with a set of machinery components, using specific criteria to asses the various individual components that make up a particular machine. Another benefit of predictive maintenance is inventory stock control of mechanical components.

- [ ] Inspect preheater system
- [ ] Inspect kiln shell
- [ ] Inspect kiln supports
- [ ] Inspect kiln drive
- [ ] Evaluate alignment and mechanical balance of kiln
- [ ] Inspect clinker cooler
- [ ] Inspect kiln lining at regular intervals
- [ ] Check the kiln shell temperature. Special attention must be focused on the covered areas in the burning zone where high surface temperatures may occur
- [ ] The clearance between the kiln shell and kiln riding-rings must be checked at regular intervals

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions are controlled by a high temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Type of control device	Baghouse
Stack height	300 feet
Exit diameter	16.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	577,700 acfm
Maximum dry standard flow rate	376,796 dscfm
Gas temperature	220° F
Percent water vapor	Ambient
Bag cleaning method	Reverse air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 021/Z-17 Cement Storage Silo #3 Discharge System with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of cement being transferred from silos. This emissions unit includes systems for in-plant distribution to loading areas and to packaging systems.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	300 TPH
Process temperature or pressure	Ambient
Chemical or physical data on product or raw materials	Cement

From the silos, the material is fed by gravity. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

All conveyor transfer points are totally enclosed. Openings for the passage of conveyors are fitted with adequate flexible seals. Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface. Conveyors are arranged to minimize free fall as far as practicable. The opening between the silos and weigh belt of the materials is fully enclosed. Loading to trucks and railcars is through a flexible rubber boot. All dust-laden air generated by the material transfer process shall be totally vented to fabric filtering system to meet the emission limits stipulated above.

Maintenance of Affected Source

- ☐ Inspect and adjust all belt conveyors and their skirting rubber and dust seals
- ☐ Check the speed of belt conveyors and slow then down, if possible, to reduce dust circulation and spillage
- ☐ Replace torn or defective conveyor belts
- ☐ Inspect belt conveyor idlers and nonmoving idlers
- ☐ Remove and replace missing or broken idlers
- ☐ Inspect all belt conveyor training idlers, adjust as necessary so the conveyor belt does not travel laterally
- ☐ Inspect belt scrapers on belt conveyors and adjust, replace worn-out components
- ☐ Inspect all pneumatic lines and pumps for cracks
- ☐ Inspect rubber boots for cracks and tears

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	Z-17
Type of control device	Baghouse
Stack height	50 feet
Exit diameter	1.5 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	10000 acfm
Maximum dry standard flow rate	8346 dscfm
Gas temperature	160° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 022/Z-15 Cement Storage Silo #3 with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of cement being pneumatically transferred to the storage silo from the finish mill.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	125 TPH
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Cement

The material is transferred to the silos pneumatically. From the silo, the material is fed by gravity to trucks or railcars, or pneumatically to bagging. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The silo is equipped with audible high level alarms to warn of overfilling. The high-level alarm indicators are interlocked with the material filling line such that in the event of a silo approaching an overfilling condition, an audible alarm will operate, and the material filling line will be closed.

Maintenance of Affected Source

Silos are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a silo for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Deteriorated doors and door frames should be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the silo's life. Silos need periodic inspection and maintenance, such as cleaning. Each year, preferably when the silo is empty, a thorough inspection of the entire structure is to be performed, and repairs are to be made where necessary.

Storage silos allow cement plants to stockpile inventory until needed. Buildup on the vessel walls, however, can rob plants of the storage systems in which they have invested. Buildups slow material flow and decrease the "live" capacity of the vessel. Overcoming these flow problems and recovering storage capacity may require silo cleaning.

Several types of equipment can be used for silo cleaning. One of these operates like an industrial-strength "weed whip," rotating a set of "flails" against the material in the

vessel. The cleaning head is typically inserted through the access port down into the vessel on a pivoting arm.

Any clean-out activity must be carefully controlled to avoid damage to the inner wall, which can reduce flow and cause continuing problems. Steel chain is commonly used for cement or any compacted material where there is no risk of explosion. Nonsparking brass chain is effective for compacted materials where the risk of fire or explosion is present.

Before the cleaning process is initiated, a path for loosened material to leave the vessel must be secured, and the discharge opening must be clear. A transport mechanism at the bottom — a conveyor, a truck, or a loader — is required to avoid buildup below the discharge and blockage of the opening as large quantities of material are removed. In cleaning, the operator starts at the bottom and progresses upward. Wall accumulations are undercut until they fall by their own weight. Cleaning from the top would cause the removed material to fall on top of the lower accumulation with no place to go until the entire mass is cut away; when the entire section falls, then, the risk of damage to the bottom of the vessel or discharge is considerable.

If a vessel is choked, that is, still running but nearly closed down, it will most likely get worse. As material falls through the vessel, it will build up on the accumulations, gradually restricting the flow path until blockage is total. Consequently, as soon as a partial blockage is noticed, scheduling a cleaning from a service is recommended. Time is then available to work the cleaning into the schedule of the plant and the cleaning contractor. Hung up, clogged, or slow running silos will interfere with the efficiency and profitability of a plant. Remove buildup from silo walls regularly, effectively, and safely.

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a medium temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	Z-15
Type of control device	Baghouse
Stack height	200 feet
Exit diameter	2.0 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	5300 acfm
Maximum dry standard flow rate	4285 dscfm
Gas temperature	180° F
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 023 Cement Storage Silo #4 and Truck Loadout System with Baghouse

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of cement being pneumatically transferred to the storage silo from the finish mill and an activity of cement being transferred from the silo. This emissions unit includes systems for in-plant distribution to loading areas and to packaging systems.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	47 TPH: silo, 390 TPH: trucks
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Cement

The material is transferred to the silos pneumatically. From the silo, the material is fed by gravity to trucks or railcars, or pneumatically to bagging. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The silo is equipped with audible high level alarms to warn of overfilling. The high-level alarm indicators are interlocked with the material filling line such that in the event of a silo approaching an overfilling condition, an audible alarm will operate, and the material filling line will be closed.

All conveyor transfer points are totally enclosed. Openings for the passage of conveyors are fitted with adequate flexible seals. Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface. Conveyors are arranged to minimize free fall as far as practicable. The opening between the silos and weigh belt of the materials is fully enclosed. Loading to trucks and railcars is through a flexible rubber boot. All dust-laden air generated by the material transfer process shall be totally vented to fabric filtering system to meet the emission limits stipulated above.

Maintenance of Affected Source

Silos are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a silo for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Deteriorated doors and door frames should be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the silo's life. Silos need periodic inspection and maintenance, such as cleaning.

Each year, preferably when the silo is empty, a thorough inspection of the entire structure is to be performed, and repairs are to be made where necessary.

Storage silos allow cement plants to stockpile inventory until needed. Buildup on the vessel walls, however, can rob plants of the storage systems in which they have invested. Buildups slow material flow and decrease the "live" capacity of the vessel. Overcoming these flow problems and recovering storage capacity may require silo cleaning. Do not try to clean a vessel from below. To protect both plant personnel and the structure, the safest method is to clean down from the access opening(s) at the top of the vessel. That opening, however, is not to be used for putting people down into the silo, which likely would constitute a violation of the confined space entry rules.

Several types of equipment can be used for silo cleaning. One of these operates like an industrial-strength "weed whip," rotating a set of "flails" against the material in the vessel. The cleaning head is typically inserted through the access port down into the vessel on a pivoting arm.

Any clean-out activity must be carefully controlled to avoid damage to the inner wall, which can reduce flow and cause continuing problems. Steel chain is commonly used for cement or any compacted material where there is no risk of explosion. Nonsparking brass chain is effective for compacted materials where the risk of fire or explosion is present.

Before the cleaning process is initiated, a path for loosened material to leave the vessel must be secured, and the discharge opening must be clear. A transport mechanism at the bottom — a conveyor, a truck, or a loader — is required to avoid buildup below the discharge and blockage of the opening as large quantities of material are removed. In cleaning, the operator starts at the bottom and progresses upward. Wall accumulations are undercut until they fall by their own weight. Cleaning from the top would cause the removed material to fall on top of the lower accumulation with no place to go until the entire mass is cut away; when the entire section falls, then, the risk of damage to the bottom of the vessel or discharge is considerable.

If a vessel is choked, that is, still running but nearly closed down, it will most likely get worse. As material falls through the vessel, it will build up on the accumulations, gradually restricting the flow path until blockage is total. Consequently, as soon as a partial blockage is noticed, scheduling a cleaning from a service is recommended. Time is then available to work the cleaning into the schedule of the plant and the cleaning contractor. Hung up, clogged, or slow running silos will interfere with the efficiency and profitability of a plant. Remove buildup from silo walls regularly, effectively, and safely.

- ☐ Inspect and adjust all belt conveyors and their skirting rubber and dust seals
- ☐ Check the speed of belt conveyors and slow then down, if possible, to reduce dust circulation and spillage
- ☐ Replace torn or defective conveyor belts
- ☐ Inspect belt conveyor idlers and nonmoving idlers
- ☐ Remove and replace missing or broken idlers

- [ ] Inspect all belt conveyor training idlers, adjust as necessary so the conveyor belt does not travel laterally
- [ ] Inspect belt scrapers on belt conveyors and adjust, replace worn-out components
- [ ] Inspect all pneumatic lines and pumps for cracks
- [ ] Inspect rubber boots for cracks and tears

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Type of control device	Baghouse
Stack height	75 feet
Exit diameter	0.8 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	860 acfm
Maximum dry standard flow rate	829 dscfm
Air to cloth ratio	
Bag weave	
Bag material	
Gas temperature	Ambient
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

EU 024/Z-18 Cement Storage Silo and Railcar Loadout System with Baghouses

Emission Limits and Operating Limits

The owner or operator shall not cause to be discharged any gases from this affected source which exhibit opacity in excess of ten percent.
[40 CFR 63.1348]

Operation of Affected Source

This emissions unit is an activity of cement being pneumatically transferred to the storage silo from the finish mill and an activity of cement being transferred from the silo. This emissions unit includes systems for in-plant distribution to loading areas.

OPERATIONAL PARAMETERS FOR EMISSIONS UNIT

Weight per unit time of raw materials input	30 TPH: silo, 100 TPH: trucks
Process temperature or pressure	>Ambient
Chemical or physical data on product or raw materials	Cement

The material is transferred to the silos pneumatically. From the silo, the material is fed by gravity to trucks or railcars. The loading, unloading, handling, transfer and storage of materials is in a totally enclosed system. All dust-laden air generated by the process operations is extracted and vented to the fabric filtering system to meet the emission limits stipulated above.

The silo is equipped with audible high level alarms to warn of overfilling. The high-level alarm indicators are interlocked with the material filling line such that in the event of a silo approaching an overfilling condition, an audible alarm will operate, and the material filling line will be closed.

All conveyor transfer points are totally enclosed. Openings for the passage of conveyors are fitted with adequate flexible seals. Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface. Conveyors are arranged to minimize free fall as far as practicable. The opening between the silos and weigh belt of the materials is fully enclosed. Loading to trucks and railcars is through a flexible rubber boot. All dust-laden air generated by the material transfer process shall be totally vented to fabric filtering system to meet the emission limits stipulated above.

Maintenance of Affected Source

Silos are prone to internal buildup of material, particularly if material is wet or if aeration is inadequate. Periodic inspection (every 1-2 years) and maintenance are necessary.

In order to use a silo for material storage, it must be structurally sound, with no evidence of major deterioration or over stressing. Deteriorated doors and door frames should be repaired to prevent possible air leakage during aeration. Regular maintenance will help extend the silo's life. Silos need periodic inspection and maintenance, such as cleaning.

Each year, preferably when the silo is empty, a thorough inspection of the entire structure is to be performed, and repairs are to be made where necessary.

Storage silos allow cement plants to stockpile inventory until needed. Buildup on the vessel walls, however, can rob plants of the storage systems in which they have invested. Buildups slow material flow and decrease the "live" capacity of the vessel. Overcoming these flow problems and recovering storage capacity may require silo cleaning.

Several types of equipment can be used for silo cleaning. One of these operates like an industrial-strength "weed whip," rotating a set of "flails" against the material in the vessel. The cleaning head is typically inserted through the access port down into the vessel on a pivoting arm.

Any clean-out activity must be carefully controlled to avoid damage to the inner wall, which can reduce flow and cause continuing problems. Steel chain is commonly used for cement or any compacted material where there is no risk of explosion. Nonsparking brass chain is effective for compacted materials where the risk of fire or explosion is present.

Before the cleaning process is initiated, a path for loosened material to leave the vessel must be secured, and the discharge opening must be clear. A transport mechanism at the bottom — a conveyor, a truck, or a loader — is required to avoid buildup below the discharge and blockage of the opening as large quantities of material are removed. In cleaning, the operator starts at the bottom and progresses upward. Wall accumulations are undercut until they fall by their own weight. Cleaning from the top would cause the removed material to fall on top of the lower accumulation with no place to go until the entire mass is cut away; when the entire section falls, then, the risk of damage to the bottom of the vessel or discharge is considerable.

If a vessel is choked, that is, still running but nearly closed down, it will most likely get worse. As material falls through the vessel, it will build up on the accumulations, gradually restricting the flow path until blockage is total. Consequently, as soon as a partial blockage is noticed, scheduling a cleaning from a service is recommended. Time is then available to work the cleaning into the schedule of the plant and the cleaning contractor. Hung up, clogged, or slow running silos will interfere with the efficiency and profitability of a plant. Remove buildup from silo walls regularly, effectively, and safely.

- ☐ Inspect and adjust all belt conveyors and their skirting rubber and dust seals
- ☐ Check the speed of belt conveyors and slow then down, if possible, to reduce dust circulation and spillage
- ☐ Replace torn or defective conveyor belts
- ☐ Inspect belt conveyor idlers and nonmoving idlers
- ☐ Remove and replace missing or broken idlers
- ☐ Inspect all belt conveyor training idlers, adjust as necessary so the conveyor belt does not travel laterally
- ☐ Inspect belt scrapers on belt conveyors and adjust, replace worn-out components
- ☐ Inspect all pneumatic lines and pumps for cracks

☐ Inspect rubber boots for cracks and tears

Operation of Air Pollution Control Device

The filter equipment will be operated and maintained according to the manufacturer's recommendations. An adequate inventory of spare parts shall be kept. The particulate matter (PM) emissions from the materials being transferred are controlled by a low temperature baghouse fabric filter system. The baghouse is put in operation prior to the start of source operation, and remains in operation while the source is in operation.

Operators are familiar with startup and shutdown procedures of dust control systems. All dust control systems should be in operation before any processing equipment is started. Certain units are equipped with an alarm to sound when a dust collector stops operating.

OPERATIONAL PARAMETERS FOR BAGHOUSE

Identification of control device	Z-18
Type of control device	Baghouse
Stack height	80 feet
Exit diameter	1.5 feet
Bag pressure drop	2-6" H_2O
Actual volumetric flow rate	500 acfm
Maximum dry standard flow rate	490 dscfm
Gas temperature	Ambient
Percent water vapor	Ambient
Bag cleaning method	Pulsed air
Bag cleaning cycle:	Periodic

Maintenance of Air Pollution Control Device

See Attachment 1 – Baghouse Maintenance.

Corrective Actions

The owner or operator of a raw mill or finish mill shall monitor opacity by conducting daily visual emissions observations of the mill sweep and air separator PMCDs of these affected sources, in accordance with the procedures of Method 22 of appendix A of 40 CFR 60. The Method 22 test shall be conducted while the affected source is operating at the highest load or capacity level reasonably expected to occur within the day. The duration of the Method 22 test shall be six minutes.

If visible emissions are observed during any Method 22 visible emissions test, the owner or operator must:

(1) Initiate, within one-hour, the corrective actions specified in this site specific operating and maintenance plan; and

(2) Within 24 hours of the end of the Method 22 test in which visible emissions were observed, conduct a visual opacity test of each stack from which visible emissions were observed in accordance with Method 9 of appendix A of 40 CFR 60. The duration of the Method 9 test shall be thirty minutes.

Applicability of Corrective Actions

The requirement for site-specific corrective actions applies to:

☐ EU 013/N-13 Finish Mill with Baghouse

Description of Corrective Actions

- Notify control room that finish mill will be going off-line
- Determine availability of clinker storage volume
- Take kiln off-line only as necessary
- Gradually reduce milling rate and cease milling operation
- Perform complete baghouse and ductwork inspection
- Perform necessary repairs
- Put baghouse in operation
- Resume milling
- If any new bags have been installed, allow bags to form a filter cake before conducting the Method 9 test specified above

Annual Combustion System Inspection

An inspection of the components of the combustion system of the in-line kiln raw mill shall be conducted at least once per year. Optimum combustion conditions in cement kiln systems occur when kiln exit gas oxygen and carbon monoxide emissions are as low as possible. Stated another way, optimum combustion conditions occur when excess air is as low as possible and complete combustion still occurs. A kiln operating with low excess air may cause partial combustion of fuel. A kiln system operating with high excess air increases the heat loss in the kiln system exit gases. In either case, the net effects are higher specific fuel consumption and lower clinker production.

At a minimum, an inspection shall include the following:

1) Inspect all burners, pilot assemblies, and pilot sensing devices for proper operation; clean pilot flame sensor, as necessary;
2) Ensure proper adjustment of primary and secondary combustion air, and adjust as necessary;
3) Inspect hinges and door latches, and lubricate as necessary;
4) Inspect dampers, fans, and blowers for proper operation;
5) Inspect door and door gaskets for proper sealing;
6) Inspect motors for proper operation;
7) Inspect refractory lining; clean and repair/replace lining as necessary;
8) Inspect kiln shell for corrosion and/or hot spots;
9) Inspect kiln, preheater and stack, clean as necessary;
10) Inspect fuel supply systems, for proper operation;
11) For the burning that follows the inspection, document that the combustion system is operating properly and make any necessary adjustments;
12) Inspect air pollution control device(s) for proper operation;
13) Inspect gas conditioning systems to ensure proper operation;
14) Ensure proper calibration of thermocouples, sorbent feed systems and any other monitoring equipment; and
15) Generally observe that the equipment is maintained in good operating condition.

Within 10 operating days following an equipment inspection all necessary repairs shall be completed unless the owner or operator obtains written approval from the State agency establishing a date whereby all necessary repairs of the designated facility shall be completed.

Periodic Monitoring

This section provides procedures to be used to periodically monitor affected sources subject to opacity standards under 40 CFR 63.1346 and 63.1348.

Applicability of Periodic Monitoring

- ☐ EU 001/D-75 Filter Dust Bin
- ☐ EU 002/D-67 Fly Ash/Equilibrium Catalyst Bin
- ☐ EU 004/F-14 Raw Meal Transfer
- ☐ EU 006/G-12A & B Two Blend Silos
- ☐ EU 007/H-15 Kiln Feed Surge Bin
- ☐ EU 008/S-04 Clinker Receiving/Handling System
- ☐ EU 010/L-06 & L-07 Clinker Storage Silo & Finish Mill Storage Silo
- ☐ EU 011/L-08 Gypsum and Limestone Bins
- ☐ EU 012/M-08 Silo Discharge
- ☐ EU 014/Q-17 Cement Storage Silos #1 & #2 Discharge System
- ☐ EU 015/Q-15 Cement Storage Silos #1 & #2

☐	EU 017/D-63	Iron Ore Bin
☐	EU 019/M-05	Finish Mill Feed Belt
☐	EU 021/Z-17	Cement Storage Silo #3 Discharge System
☐	EU 022/Z-15	Cement Storage Silo #3
☐	EU 023	Cement Storage Silo #4 and Truck Loadout System
☐	EU 024/Z-18	Cement Storage Silo and Railcar Loadout System

Procedures for Periodic Monitoring

The owner or operator must conduct a monthly 1-minute visible emissions test of each affected source in accordance with Method 22 of Appendix A to 40 CFR 60. The test must be conducted while the affected source is in operation.

If no visible emissions are observed in six consecutive monthly tests for any affected source, the owner or operator may decrease the frequency of testing from monthly to semi-annually for that affected source. If visible emissions are observed during any semi-annual test, the owner or operator must resume testing of that affected source on a monthly basis and maintain that schedule until no visible emissions are observed in six consecutive monthly tests.

If no visible emissions are observed during the semi-annual test for any affected source, the owner or operator may decrease the frequency of testing from semi-annually to annually for that affected source. If visible emissions are observed during any annual test, the owner or operator must resume testing of that affected source on a monthly basis and maintain that schedule until no visible emissions are observed in six consecutive monthly tests.

If visible emissions are observed during any Method 22 test, the owner or operator must conduct a 6-minute test of opacity in accordance with Method 9 of appendix A to 40 CFR 60. The Method 9 test must begin within one hour of any observation of visible emissions.

Reporting Requirements

The O&M Plan includes procedures for an annual inspection of the combustion system. Results of this inspection are to be included with annual reporting.

Maintenance and inspection records will be kept for five years and provided upon request.

Startup, Shutdown, and Malfunction Plan

The purpose of the startup, shutdown, and malfunction plan is to—

(A) Ensure that, at all times, owners or operators operate and maintain affected sources, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by all relevant standards;

(B) Ensure that owners or operators are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and

(C) Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

Procedures for Malfunctions

Malfunctions shall be corrected as soon as practicable after their occurrence in accordance with the startup, shutdown, and malfunction plan of this section.

The equipment subject to the MACT standards includes equipment such as process equipment (e.g., kiln, raw and finish mills), storage silos, control devices (e.g., baghouses), and continuous monitoring systems (CMS; i.e., monitoring systems used to demonstrate compliance with the MACT standards during normal operation).

Potential malfunctions of the applicable equipment were evaluated to determine whether a particular malfunction could result in excess HAP emissions. Potential malfunctions that may result in excess HAP emissions include:

- broken bags in baghouses
- excess or inadequate combustion air
- high level in a storage vessel
- excessive temperature at inlet of control device

Corrective actions are identified for all malfunctions that have the potential for excess HAP emissions. The standards do not necessarily require facilities to control HAP emissions resulting from malfunctions to the level established in the standard, but to do their best to minimize emissions. The corrective actions are documented in the SSM plan. Operations personnel have reviewed the proposed corrective actions to validate that each will effectively mitigate the malfunction and the resulting excess HAP emissions, while also providing sufficient operational flexibility.

The malfunction scenarios have been identified in the SSM plan and corrective actions have been specified.

broken bags in baghouses	Repair bags as necessary
excess or inadequate combustion air	Adjust combustion O2
high level in a storage vessel	Cease filling, reduce level
excessive temperature at inlet of control device	Repair gas conditioning equipment

The corrective actions allow operators to react to the malfunction to minimize excess HAP emissions, achieve compliance with the standard, and maintain operational flexibility.

Where two (or more) corrective actions are available, both are included in the SSM plan. This prevents the facility from deviating from the plan (and having to report the deviation to the regulatory agency) if one of the alternatives is not available or is not feasible when a malfunction occurs.

Part of an effective SSM plan implementation is to record the time and duration of each malfunction event identified. Compliance management tools, such as monitoring and recordkeeping systems, are essential in order to demonstrate continued compliance with the SSM requirements. Included in the SSM plan are the monitoring instruments (e.g., oxygen sensors, vessel high level alarms) that will be used to record SSM events for each piece of equipment subject to the standard. Where no instrumentation is available, visual inspections of certain equipment will be performed and documented at regular intervals to demonstrate that SSM events are not occurring.

This SSM plan includes startup and shutdown procedures for the equipment subject to the MACT standards. These procedures were discussed with operations personnel to determine whether a particular routine startup or shutdown activity potentially results in excess HAP emissions. Any that do are documented in the SSM plan.

Specific maintenance procedures for the air pollution control devices and the continuous monitoring systems were developed and documented in the O&M plan or the SSM plan, including the frequency of implementation. The plan identifies all routine or otherwise predictable continuous monitoring systems malfunctions. Routine calibration of the continuous monitoring systems is required. An onsite inventory of critical spare parts is maintained. Routine maintenance of all monitoring equipment is documented.

Procedures for Startup and Shutdown

Specific procedures for startup and shutdown are included with this plan as attachments.

Reporting

When actions taken by the owner or operator during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) are consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, the owner or operator shall keep records for that event that demonstrate that the procedures specified in the plan were followed. These records may take the form of a ''checklist,'' or other effective form of recordkeeping, that confirms conformance with the startup, shutdown, and malfunction plan for that event.

In addition, the owner or operator shall keep records of these events as specified in 40 CFR 63.10(b) (and elsewhere in this part), including records of the occurrence and duration of each startup, shutdown, or malfunction of operation and each malfunction of the air pollution control equipment. Furthermore, the owner or operator shall confirm that actions taken during the relevant reporting period during periods of startup, shutdown, and malfunction were consistent with the affected source's startup, shutdown and malfunction plan in the semiannual (or more frequent) startup, shutdown, and malfunction report required in 40 CFR 63.10(d)(5).

If an action taken by the owner or operator during a startup, shutdown, or malfunction (including an action taken to correct a malfunction) is not consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, the owner or operator shall record the actions taken for that event and shall report such actions within 2 working days after commencing actions inconsistent with the plan, followed by a letter within 7 working days after the end of the event, in accordance with 40 CFR 63.10(d)(5) (unless the owner or operator makes alternative reporting arrangements, in advance, with the Administrator.

Two kinds of reports are required: the immediate SSM deviation report, and the semi-annual SSM report. A deviation report is sent to the regulatory agency each time an SSM event occurs and the facility deviates from its SSM plan. This notification must be made within two days by phone or facsimile, followed by a written letter within seven days.

The semi-annual report summarizes all of the deviations in the six-month reporting period. Customized reports can be designed and incorporated into the SSM CMT to provide both immediate and periodic reports.

The owner or operator shall keep the written startup, shutdown, and malfunction plan on record after it is developed to be made available for inspection, upon request, by the Administrator for the life of the affected source or until the affected source is no longer subject to the provisions of this part. In addition, if the startup, shutdown, and malfunction plan is revised, the owner or operator shall keep previous (i.e., superseded) versions of the startup, shutdown, and malfunction plan on record, to be made available for inspection, upon request, by the Administrator, for a period of 5 years after each revision to the plan.

Definitions

Alkali bypass means a duct between the feed end of the kiln and the preheater tower through which a portion of the kiln exit gas stream is withdrawn and quickly cooled by air or water to avoid excessive buildup of alkali, chloride and/or sulfur on the raw feed. This may also be referred to as the ``kiln exhaust gas bypass".

Bagging system means the equipment which fills bags with Portland cement.

Clinker cooler means equipment into which clinker product leaving the kiln is placed to be cooled by air supplied by a forced draft or natural draft supply system.

Continuous monitor means a device which continuously samples the regulated parameter specified in 40 CFR 63.1350 of this subpart without interruption, evaluates the detector response at least once every 15 seconds, and computes and records the average value at least every 60 seconds, except during allowable periods of calibration and except as defined otherwise by the continuous emission monitoring system performance specifications in appendix B to part 60 of this chapter.

Conveying system means a device for transporting materials from one piece of equipment or location to another location within a facility. Conveying systems include but are not limited to the following: feeders, belt conveyors, bucket elevators and pneumatic systems.

Conveying system transfer point means a point where any material including but not limited to feed material, fuel, clinker or product, is transferred to or from a conveying system, or between separate parts of a conveying system.

Dioxins and furans (D/F) means tetra-, penta-, hexa-, hepta-, and octa-chlorinated dibenzo dioxins and furans.

Excess HAP Emissions — emissions in excess of those that would have occurred if there were no startup, shutdown or malfunction and the owner or operator complied with the relevant provisions of the regulation.

Facility means all contiguous or adjoining property that is under common ownership or control, including properties that are separated only by a road or other public right-of-way.

Feed means the prepared and mixed materials, which include but are not limited to materials such as limestone, clay, shale, sand, iron ore, mill scale, cement kiln dust and flyash, that are fed to the kiln. Feed does not include the fuels used in the kiln to produce heat to form the clinker product.

Finish mill means a roll crusher, ball and tube mill or other size reduction equipment used to grind clinker to a fine powder. Gypsum and other materials may be added to and blended with clinker in a finish mill. The finish mill also includes the air separator associated with the finish mill.

Greenfield kiln, in-line kiln/raw mill, or raw material dryer means a kiln, in-line kiln/raw mill, or raw material dryer for which construction is commenced at a plant site (where no kilns and no in-line kiln/raw mills were in operation at any time prior to March 24, 1998) after March 24, 1998.

Hazardous waste is defined in 40 CFR 261.3 of this chapter.

In-line kiln/raw mill means a system in a Portland cement production process where a dry kiln system is integrated with the raw mill so that all or a portion of the kiln exhaust gases are used to perform the drying operation of the raw mill, with no auxiliary heat source used. In this system the kiln is capable of operating without the raw mill operating, but the raw mill cannot operate without the kiln gases, and consequently, the raw mill does not generate a separate exhaust gas stream.

Kiln means a device, including any associated preheater or precalciner devices, that produces clinker by heating limestone and other materials for subsequent production of Portland cement.

Kiln exhaust gas bypass means alkali bypass.

Malfunction — any sudden, infrequent, and not reasonably preventable failure of air-pollution control equipment, process equipment, or a process to operate in a normal or usual manner.

Monovent means an exhaust configuration of a building or emission control device (e. g. positive pressure fabric filter) that extends the length of the structure and has a width very small in relation to its length (i. e., length to width ratio is typically greater than 5:1). The exhaust may be an open vent with or without a roof, louvered vents, or a combination of such features.

New brownfield kiln, in-line kiln raw mill, or raw material dryer means a kiln, in-line kiln/raw mill or raw material dryer for which construction is commenced at a plant site (where kilns and/or in-line kiln/raw mills were in operation prior to March 24, 1998) after March 24, 1998.

One-minute average means the average of thermocouple or other sensor responses calculated at least every 60 seconds from responses obtained at least once during each consecutive 15 second period.

Portland cement plant means any facility manufacturing Portland cement.

Raw material dryer means an impact dryer, drum dryer, paddle-equipped rapid dryer, air separator, or other equipment used to reduce the moisture content of feed materials.

Raw mill means a ball and tube mill, vertical roller mill or other size reduction equipment, that is not part of an in-line kiln/raw mill, used to grind feed to the appropriate size. Moisture may be added or removed from the feed during the grinding operation. If the raw mill is used to remove moisture from feed materials, it is also, by definition, a raw material dryer. The raw mill also includes the air separator associated with the raw mill.

Rolling average means the average of all one-minute averages over the averaging period.

Run average means the average of the one-minute parameter values for a run.

Shutdown — the cessation/stopping of operation of an affected source.

Startup — the setting into operation of an affected source.

TEQ means the international method of expressing toxicity equivalents for dioxins and furans as defined in U.S. EPA, Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 Update, March 1989.

References

The Cement Plant Operations Handbook, 3rd Edition. International Cement Review. November 2001.

A Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant). Environmental Protection Department. Air Management Group. November 1993.

AP-42 Section 11.6: Portland Cement Manufacturing. United States Environmental Protection Agency. January 1995.

AP-42 Section 11.12: Concrete Batching. United States Environmental Protection Agency. October 2001.

Rule 62-296.700, F.A.C. Reasonably Available Control Technology (RACT) Particulate Matter. Florida Department of Environmental Protection. March 1999.

Maintenance Checklist for a Better Baghouse. Cement Americas. May 1999.

Operating and Preventive Maintenance Procedures, OSHA Silica Advisor. http://www.osha-slc.gov/SLTC/silica_advisor/protect_against/protect_against.html

Removing Material Buildup from Cement Storage Silos. Jim Stuckey. Cement Americas. July 2002.

Emissions Activity Category Form Cement Manufacturing And Blending Plants: Fugitive Dust Emissions. Ohio EPA. 199. http://www.epa.state.oh.us/dapc/fops/eac/Cement.pdf.

Failure of Dust Suppression Systems at Coal Handling Plants of Thermal Power Stations. Makarand Joshi.
http://www.plant-maintenance.com/articles/dust_suppression.pdf

European Commission Directorate-General Joint Research Centre. Integrated Pollution Prevention and Control (IPPC). Reference Document on Best Available Techniques in the Cement and Lime Manufacturing Industries. March 2000.

Martin Sprocket & Gear, Inc. Comprehensive brochure.
Kiln Maintenance. FL Smidth Institute.
http://www.flsmidth.com/services/Seminars/kiln_maintenance.pdf

Entek International Corporation. Adelaide Brighton Cement Ltd. -- Business Success Profile.
http://www.entekird.com/news/profiles/Adelaide%20Brighton%20Cement%20Ltd.pdf

40 CFR Part 60. 40 CFR 60.36e Inspection guidelines.

Develop an Effective Startup, Shutdown and Malfunction Plan. Chad Scott, P.E., and Shishir Mohan, Trinity Consultants. CEP August 2002. www.cepmagazine.org.

http://www.martinsprocket.com/innovation.htm
http://www.state.ia.us/epd/air/prof/oper/tech/baghouse.pdf
http://www.state.ia.us/epd/air/prof/oper/tech/esp.pdf
http://www.cdphe.state.co.us/ap/down/FSstart.PDF
http://cementtour.cementamericas.com/ar/cement_maintenance_checklist_better/
http://www.goodyearindustrialproducts.com/conveyorbelts/troubleshoot.html

Attachment 1: Baghouse Maintenance for Affected Sources other than In-line Kiln/Raw Mill/Clinker Cooler

Daily

- Maintain a written record of the observation and any action resulting from the inspection.

Weekly

- Check and document the baghouse pressure drop. If the pressure drop falls out of the normal operating range, specified by the manufacturer, corrective action will be taken to return the pressure drop to normal.
- Check drive components on fan.
- Maintain a written record of the observation and any action resulting from the inspection.

Monthly

- Visible emissions shall be observed on a monthly basis to ensure no visible emissions during the material handling operation of the unit. If weather conditions prevent the observer from conducting an opacity observation, the observer shall note such conditions on the data observation sheet. If unsuccessful that day due to weather, an observation shall be made the following day.
- Check the cleaning sequence of the baghouse.
- Pulse jet baghouse - check the air delivery system.
- Check compressed air lines including oilers and filters.
- Check the hopper functions and performance.
- Check all moving parts on the discharge system and screw-conveyor bearings.
- If leaks or abnormal conditions are detected the appropriate measures for repair will be implemented within eight (8) hours.
- Maintain a written record of the inspection and any action resulting from the inspection.

Quarterly

- Thoroughly inspect bags for leaks and wear. (Look for obvious holes or tears in the bags.) If leaks or abnormal conditions are detected the appropriate measures for repair will be implemented within eight (8) hours. Bag replacement should be documented by identifying the date, time and location of the bag in relationship to the other bags. The location should be identified on an overhead drawing of the bag layout in the baghouse.
- Check fan for corrosion and blade wear.
- Inspect baghouse housing for corrosion.
- Maintain a written record of the inspection and any action resulting from the inspection.

Semiannual

- Inspect every 6 months all components that are not subject to wear or plugging, including structural components, housing, ducts and hoods.

- ❑ Check duct for dust buildup.
- ❑ Check gaskets on all doors.
- ❑ Inspect paint on baghouse.
- ❑ Maintain a written record of the inspection and any action resulting from the inspection.

Annual

- ❑ Check all welds and bolts.
- ❑ Check hopper for wear.
- ❑ Replace high-wear parts on cleaning system.
- ❑ Maintain a written record of the observation and any action resulting from the inspection.

Inspection of rotary valves

Inspect the condition of the following:

- ☐ check for wear on bearings and shaft
- ☐ check hopper and chute for holes and leaks
- ☐ check sprocket and chain for wear
- ☐ check chain for tightness
- ☐ spray a thin film of oil on chain
- ☐ check the alignment of the sprockets
- ☐ check oil in gear box
- ☐ check bolts for tightness
- ☐ check gear box for oil leaks
- ☐ are all guards in place and bolted down?

Service of separator duct

- ☐ clean the draft duct from the separator to the dust collector
- ☐ open bottom of dust collector
- ☐ clean all hard build-up inside hopper
- ☐ clean and remove all lumps from grates
- ☐ check that all draft pipes are clear, and clean if necessary
- ☐ lightly tap on all duct work to ensure that pipes are open
- ☐ check partition and walls for cracks
- ☐ seal cracks found in partitions
- ☐ check operation of purge valves
- ☐ check dust pipes and air pipes for leaks
- ☐ check door gaskets for leaks
- ☐ replace broken bags
- ☐ tighten all loose bags
- ☐ remove any dust build up from bags
- ☐ check bag clamps, and replace them if defective
- ☐ clean and remove any dust build up from all compartments

Record number of new bags used: ____________________________

Record in the space below any condition that will require major repairs:______________

____

Service of pressurizing unit

Cleaning of bottom hopper:

- ☐ place dumpster under hopper
- ☐ inspect bottom of hopper slide gate
- ☐ open bottom of dust collector slide gate
- ☐ lightly tap on hopper to insure that all dust is out of hopper.
- ☐ open bottom hopper inspection.
- ☐ clean all hard build-up inside hopper.
- ☐ clean and remove all lumps from grates.
- ☐ inspect operation of hopper door and seal
- ☐ close hopper inspection door

Record in the space below any condition that will require major repairs:______________

____

Safety note!!! Respirators must be worn when working inside dust collector.

Attachment 2: Baghouse Maintenance for In-line Kiln/Raw Mill/Clinker Cooler

Daily

- Maintain a written record of the observation and any action resulting from the inspection.

Weekly

- Check and document the baghouse pressure drop. If the pressure drop falls out of the normal operating range, specified by the manufacturer, corrective action will be taken to return the pressure drop to normal.
- Check drive components on fan.
- Maintain a written record of the observation and any action resulting from the inspection.

Monthly

- Visible emissions shall be observed on a monthly basis to ensure no visible emissions during the material handling operation of the unit. If weather conditions prevent the observer from conducting an opacity observation, the observer shall note such conditions on the data observation sheet. If unsuccessful that day due to weather, an observation shall be made the following day.
- Check the cleaning sequence of the baghouse.
- Pulse jet baghouse - check the air delivery system.
- Check compressed air lines including oilers and filters.
- Check the hopper functions and performance.
- Check all moving parts on the discharge system and screw-conveyor bearings.
- If leaks or abnormal conditions are detected the appropriate measures for repair will be implemented within eight (8) hours.
- Maintain a written record of the inspection and any action resulting from the inspection.

Quarterly

- Thoroughly inspect bags for leaks and wear. (Look for obvious holes or tears in the bags.) If leaks or abnormal conditions are detected the appropriate measures for repair will be implemented within eight (8) hours. Bag replacement should be documented by identifying the date, time and location of the bag in relationship to the other bags. The location should be identified on an overhead drawing of the bag layout in the baghouse.
- Check fan for corrosion and blade wear.
- Inspect baghouse housing for corrosion.
- Maintain a written record of the inspection and any action resulting from the inspection.

Semiannual

- Inspect every 6 months all components that are not subject to wear or plugging, including structural components, housing, ducts and hoods.
- Check duct for dust buildup.
- Check gaskets on all doors.
- Inspect paint on baghouse.
- Maintain a written record of the inspection and any action resulting from the inspection.

Annual

- Check all welds and bolts.
- Check hopper for wear.
- Replace high-wear parts on cleaning system.
- Maintain a written record of the observation and any action resulting from the inspection.

Attachment 3: Baghouse Startup Procedures

Proper start-up procedures will help extend the life of new filter media in a dust collector. What is generally accepted as start-up procedures is the process designed to intentionally develop a dust cake on the bags. This is referred to as seasoning, or conditioning, the filter media. In a fabric filter dust collector, the filter media is used to support a dust cake. A dust cake is the porous layer of collected particulate that develops during the conditioning period of new collector bags and following each cleaning cycle. The process can be accelerated in many installations by introducing a precoat material, such as agricultural lime, into the system. Commercial precoats also are available. Following installation of the filter bags and inspection of the related auxiliary equipment, the exhaust fan can be started. However, it is extremely important that the new filter bags are not exposed to the full volume (ACFM) of the fan.

First, close the fan damper (or inlet dampers) to one-half open until the monitoring gauge reads about 50% to 65% of the manufacturer's recommended maximum flange-to-flange differential drop. At roughly 75% of the manufacturer's recommended differential pressure, the cleaning system can be initiated. Normal operation and periodic cleaning will bring the pressure drop to a calculable and historically stable level.

Depending on the application, development of this differential pressure may take a number of hours or even days. This is necessary to ensure that the new filter media is exposed to low filtering velocities of dust-laden air. Reducing the volume decreases the airstream's velocity (air-to-cloth ratio), thus protecting the virgin bags from a high velocity impingement of dust. Should the bags be exposed to the fan's full volume, fine particles may embed themselves into the inner fibers of the bags and create a blinding condition. This also can damage the fibers of the media, reducing the life of the bags.

Attachment 4: In-line Kiln/Raw Mill/Clinker Cooler Startup Procedures

Kiln Startup Procedures

It is important that ignition be achieved as soon as fuel is injected and, if the flame fails during warm-up, the kiln should be purged with 5 times the volume of kiln, preheater, ducting, and dust collector before re-ignition is attempted. Volatile hydrocarbons accumulate rapidly in the kiln and, if then re-ignited, will potentially explode.

Warm-up follows agreement by production and maintenance management that all work is completed, that all tools and materials have been removed and that all doors are closed. Work may, with discretion, continue in the cooler during warm-up but no workers should remain in the cooler at the time of ignition.

Commonly, warm-up from cold takes 24 hours from ignition to feed-on, but may be increased if extensive refractory work requires curing. The introduction of feed (usually 50% of full rate), and the increase of fuel, speed and feed to normal operation can take another 8 hours from feed-on. The ID fan should be operated at approximately 10% 0_2 at the back of the kiln to feed-on whereupon the normal 0_2 target is adopted.

For coal fired kilns, warm-up uses gas or oil with switch-over to coal at the time of feed-on. If the coal mill uses hot gas from the cooler, there may be a delay before heat is available from clinker.

Prior to beginning to bring the kiln on-line, the kiln/raw mill I.D. fan and baghouse are powered to normal operating conditions. The kiln is then preheated with unused No. 2 fuel oil for a period of up to 24-36 hours; depending upon how long the kiln has been shut down.

Once the kiln is sufficiently hot and while still firing unused No. 2 fuel oil, raw meal feed is fed to the preheater at about 30-40 percent of normal feed rate. This material will coat the kiln and will produce clinker that is discharged to the clinker cooler. When there is heat in the clinker cooler, the coal mill is brought on-line and coal firing to the kiln main burner is initiated. At this point, raw meal feed to the preheater is incrementally increased. As the kiln stabilizes, the raw meal feed is incrementally increased until the system is operating at full capacity. Typically, the time from feed-on to full capacity is 3-4 hours.

During the startup of the kiln/raw mill, there could be periods when emissions are higher than normal (pounds per ton of clinker) due to imbalances of feed and fuel. These periods will be minimized through good operating practices. The emissions of particulate matter (PM and PM10), are not expected to exceed permit limits (pounds per ton of clinker) during startup.

This start-up procedure assumes the kiln system has been preheated for desired refractory dry-out but the system is cold. In connection with the normal startup procedure where the linings have been dried out, the heat procedure can be reduced from the stated 72 hours to 24 hours. All fans, conveyors, air purging system, and associated equipment should be run for a minimum of eight hours and all necessary adjustments made prior to start-up.

Kiln Heat-Up

1. Start the main dust collector fan with damper closed.
2. Open the main dust collector fan damper gradually so that a negative pressure is generated at the dust collector inlet.
3. Open the damper of the preheater I.D. fan 10%.
4. Start the primary air fan and open the associated damper 10%.
5. Start the kiln burner.
6. Check that the fuel is ignited and if necessary, adjust primary air, fuel rate and draft through kiln so that a stable flame is obtained.
7. Increase the fuel volume gradually and slowly.
8. Adjust the draft level in kiln by means of the preheater I.D. fan damper, and main baghouse fan.
9. CAUTION: The flame must not cause sooting. Quite often, this will require that the 02 content indicated by the kiln back end analyzer is 6-8%.
10. It will normally be necessary to start clinker cooler fans to provide adequate combustion air.
11. Start the preheater I.D. fan, if necessary to maintain proper combustion.
12. Start rotating the kiln in accordance with the manufacturer's rotation schedule.
13. Check the supporting roller lubrication – the journals must not become dry.
14. Continuous rotation on the auxiliary drive is required if the kiln is exposed to cooling, e.g. heavy rain showers.
15. After 16 hours of preheating the temperature of the kiln lining should be sufficiently high to ensure ignition of the coal from the operation nozzle, which is put into operation as follows:

    A. Turn off the oil flow to the oil burner.
    B. Retract the oil burner completely.
    C. Replace the oil burner by a burner with an operating nozzle that is ready for operation.

16. After 18 - 20 hours when the kiln gets very hot, raw feed should be introduced to the preheater. A raw feed weight equal to 0.1% of the daily clinker output is a good estimate. When this material gets into the kiln it will help protect the refractory by coating the bricks and filling voids.
17. At the end of the kiln heat-up the remaining clinker cooler fans should be started to protect the grate plates.
18. Start the cooler vent fan to maintain the firing hood pressure by automatic control.
19. Regulate the draft (by adjusting the preheater I.D. fan damper) and the fuel flow to attain an oxygen content of 4 – 6% in the kiln inlet.

Kiln Startup

1. Recirculate kiln feed at the desired starting feed rate. It should be a minimum of 50% of feed rate at full production.
2. Start kiln shell cooling fans.
3. Start cooler drives on minimum speed. Increase the air flows on the front fans to normal operating values and put into automatic control. This will provide sufficient combustion air at startup.
4. Start main kiln drive on minimum speed.
5. Perform the following operations in rapid, but correct, sequence:

   A. Start the I.D. fan if not yet started.
   B. Start the feed to the preheater.
   C. Increase the draft when the feed enters the preheater.
   D. Increase the kiln speed to 1 rpm.
   E. Open the primary air fan damper to 40% (approximately).
   F. Gradually increase the fuel to the kiln and simultaneously adjust the draft to obtain proper oxygen level at the inlet to the kiln.
   G. Open the tertiary air damper.
   H. Adjust the draft and tertiary air to balance the oxygen levels at preheater exit and kiln inlet.

6. Personnel must be stationed in the preheater tower in order to monitor the passage of raw meal. If there is any indication of blocking, the control room must be informed immediately and the kiln operation stopped until the blockage is cleared.
7. Increase the feed and speed of kiln as soon as possible. The preheater is more efficient at high feed rates.
8. Increase the cooler undergrate air flow rates.
9. When the material arrives at the burning zone it may be necessary to reduce the kiln speed to prevent the material from passing the burning zone too quickly. It is very important that the initial material charge is well burned so that the visibility in kiln is not lost due to dust formations. The clinker must be well burnt all the time. If not, increase the raw meal temperature by increasing the draft and fuel quantity.
10. Increase the kiln speed and feed gradually so that the exit gas temperature after the preheater does not exceed safe levels.
11. The maximum production rate can generallly be achieved within a few hours after the startup.

Raw Mill Startup

Typically, the raw mill is brought on-line during the preheat of the kiln once there is sufficient heat for the raw mill to operate.

The kiln and raw mill usually operate together in what is referred to as the compound mode of operation. This operating mode occurs approximately 90 percent of the time. The remaining 10 percent of the time, the kiln operates alone in what is referred to as the direct operating mode. The raw mill is a source of particulate matter and a source of combustion products when the raw mill heater operates. The raw mill exhaust gases are discharged through the kiln baghouse.

With the kiln in the direct operating mode, the raw mill is brought on-line by opening the dampers isolating the raw mill; and as quickly and simultaneously as possible starting the raw mill fan, the raw mill and the raw mill feed.

During the startup of the raw mill while the kiln is operating, there can be a brief imbalance in the airflow through the kiln system resulting in short-term spikes in emissions from the kiln. These short-term emission spikes will be minimized by best operating practices. The raw mill startup is not expected to affect particulate matter (PM or PM10) emissions.

Clinker Cooler Startup

The clinker cooler I.D. fan and baghouse are powered prior to clinker being discharged From the kiln into the clinker cooler. The air flow and clinker flow through The cooler during startup will be controlled to optimize heat recovery. The time to bring the cooler on-line and to full capacity is dependent upon the time required To bring the kiln/raw mill to full capacity. Typically, this time period will be 3-4 hours. Emissions from the cooler are limited to PM and PM10. During the startup period, no excess emissions are expected from the clinker cooler.

It may, from time to time, be necessary to start the grate cooler and the clinker conveying system in order to transport away the materials. In order not to fill up the cooler, the grates should be moved for about 10 minutes every hour at minimum speed. To ensure effective cooling at the cooler inlet, it may at the same time be necessary to start the first fans of the cooler to ensure that there is sufficient air for combustion.

The clinker cooler startup should occur around the same time as the kiln feed startup.

1. Start clinker pan conveyors.
2. Start clinker crusher.
3. Start timer and operation of tipping valves.
4. Start cooler vent fan and adjust draft to maintain a negative pressure in the kiln firing hood.
5. Progressively, start cooler undergrate fans to provide enough combustion air to the kiln, and keep grate plate temperatures down.
6. As clinker begins to discharge into the cooler, the grates should be started to prevent any buildups.
7. Progressively, as the clinker production increases, the fan volumes should be increased, and the grates operated more frequently.

Attachment 5: In-line Kiln/Raw Mill/Clinker Cooler Shutdown Procedures

The kiln/raw mill, clinker cooler and coal mill have normal and emergency shutdown procedures. The emergency procedures will shutdown entire systems immediately and close dampers isolating the systems.

Shut-down may be either:

- Emergency, in which case all equipment upstream of the failure must be stopped immediately, or

- Controlled, in which case the feed bin and coal system should be emptied, the kiln load run out as far as possible, and the cooler emptied. The burner pipe is withdrawn, or cooling air is continued through the burner, and the kiln is rotated on a standard schedule for about 12 hours with the ID fan running at reduced speed.

Suggested inching is as follows:

Duration of Shutdown	Kiln Turning
0 - 2 hours	continuous
2 - 4 hours	1/4 turn every 15 minutes
4 - 12 hours	1/4 turn every hour

If the shut-down is for less than 24 hours and does not involve entering the kiln or preheater, then heat should be retained either by stopping the ID fan immediately and shutting the preheater dampers after 2 hours, or shutting down the fan after 2 hours.

The following procedures are followed for normal (controlled) shutdowns.

Normal Kiln/Raw Mill Shutdown

Shutdown of the kiln and raw mill, while operating in the compound operating mode, is accomplished by first shutting down the raw mill and then shutting down the kiln. The raw mill is shutdown by stopping raw meal feed, stopping the raw mill and stopping the raw mill fan quickly and as simultaneously as possible. The dampers isolating the raw mill are then quickly closed.

The kiln is shutdown by shutting off the kiln feed and cutting back on the fuel to the main kiln burner. The kiln exhaust fan is also cut back. The kiln continues turning as the fuel in the main burner is continually cut back and finally cut off. The kiln continues turning at a prescribed rate until cool. At this time, the kiln can stop being turned. The kiln baghouse remains powered as long as air is drafted through the kiln.

There are no excess emissions expected during kiln shutdown.

Shutdown Sequence

1. Stop the preheater I.D. fan. The following should happen automatically:

A. The kiln feed will stop
B. The kiln and calciner firing will stop
C. The preheater fan damper will close
D. The last two cooler fans will stop and the air flows to all other cooler fans will reduce to preset minimum

2. Stop the kiln drive.
3. Reduce the cooler grate speeds to minimum.
4. Reduce the primary air fan damper.
5. Stop the shell cooling fans.
6. Close the tertiary air damper.
7. Start kiln rotation operation as outlined above.
8. Stop the cooler grates and operate for 5 minutes every 30 minutes.

Extended Shutdowns

Where shutdown of kiln extends over a prolonged period of time, all machinery not required for rotation of kiln and cooling of burner pipe must be stopped

1. Stop the dust conveyance system when the system is empty.
2. Stop the compressors.
3. Prepare plans for subsequent clean-up operation in kiln, preheater, cooler, and baghouse.
4. After the kiln has cooled off, stop the primary air fan.
5. Stop the clinker conveying system.
6. Plan for maintenance and repair work prior to startup.

Normal Raw Mill Shutdown

The shutdown of the raw mill while the kiln continues to operate is accomplished by stopping the raw meal feed, the raw mill fan and the raw mill quickly and as simultaneously as possible. The dampers isolating the raw mill are then quickly closed. The shutdown of the raw mill can create a slight imbalance in the kiln system causing short-term spikes in emissions. The excess emissions will be minimized by good operating practices.

Normal Clinker Cooler Shutdown

The clinker cooler is shutdown following the shutdown of the kiln by cutting back on the airflow through the clinker cooler until any residual clinker in the cooler is sufficiently cool. At that time, the clinker cooler fan can be shut off. The clinker cooler baghouse operates at normal conditions during the entire time the clinker cooler fan operates.

There are no excess emissions associated with the shutdown of the clinker cooler.

Attachment 6: Startup Procedures for other Affected Facilities

Coal Mill Startup

The coal mill is required to operate when the kiln is operating. The coal mill is a source of PM and PM10 emissions and discharges through a baghouse. The coal mill is started as soon as sufficient heat is available from the clinker cooler to dry the coal. The coal is mill is started by opening the dampers isolating the coal mill; and quickly and as simultaneously as possible starting the coal mill fan, the coal mill and the coal mill feed.

No excess emissions are expected as a result of the coal mill startup.

Material Handling Systems Startup

There are fabric filter dust collectors (baghouses) used to control particulate matter (PM and PM10) emissions from emission points associated with the raw mill, clinker handling, the finish mill, cement handling and coal handling. Startup of these systems involves powering the system I.D. exhaust fans and the baghouse cleaning systems prior to commencing process operations. No excess emissions are anticipated during the startup of any of these systems.

Attachment 7: Shutdown Procedures for other Affected Facilities

Normal Coal Mill Shutdown

The shutdown of the coal mill is associated with the shutdown of the kiln. The coal mill is shutdown by shutting off the coal mill feed, the coal mill and the coal mill fan quickly and as simultaneously as possible. The dampers isolating the coal mill are then quickly shut.

There are no excess emissions associated with the shutdown of the coal mill.

Material Handling Systems Shutdown

The dust collectors associated with the material handling emission points are operated until the associated processes are shutdown. Once no material is being processed, the dust collectors are shutdown by turning off power to the I.D. fans and the baghouse cleaning systems.

No excess PM or PM10 emissions are associated with the shutdown of these dust collectors.