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JACKSONVILLE LIME FACILITY

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DIVISION OF AIR RESOURCE MANAGEMENT

PREVENTION OF SIGNIFICANT DETERIORATION/AIR CONSTRUCTION PERMIT APPLICATION

ORIGINAL

Prepared for:

Jacksonville Lime, LLC
A Carmeuse Lime & Stone and Keystone Properties JV

Jacksonville, Florida

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	degree Fahrenheit
$\mu g/m^3$	microgram per cubic meter
AAQS	ambient air quality standard
ARP	Acid Rain Program
BACT	best available control technology
BSRA	Brownfields Site Rehabilitation Agreement
CAA	Clean Air Act
$CaCO_3$	calcium carbonate (limestone)
CAIR	Clean Air Interstate Rule
CAM	compliance assurance monitoring
CaO	calcium oxide
Carmeuse	Carmeuse Lime & Stone
$CaSO_4$	calcium sulfate
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRF	capital recovery factor
CSAPR	Cross-State Air Pollution Rule
dolomitic lime	CaO•MgO
EAB	Environmental Appeals Board
EPA	U.S. Environmental Protection Agency
ESP	electrostatic precipitator
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FR	Federal Register
FSI	free swelling index
ft	foot
ft^3/min	cubic foot per minute
g/dscm	gram per dry standard cubic meter
GACT	generally available control technology
GAQM	Guideline on Air Quality Models
GHG	greenhouse gas
gr/dscf	grain per dry standard cubic foot
H_2O	water
ha	hectare
HAP	hazardous air pollutant
HSH	highest of the second-highest
IFC	International Finance Corporation
IPPC	Integrated Pollution Prevention and Control
Jacksonville Lime	Jacksonville Lime, LLC
Keystone	Keystone Properties, LLC
km	kilometer
LAER	lowest achievable emissions rate
lb	pound

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued, Page 2 of 2)

MACT	maximum achievable control technology
$MgCO_3$	magnesium carbonate
mm	millimeter
MMBtu/hr	million British thermal units per hour
N_2	nitrogen
NAAQS	national ambient air quality standards
NAICS	North American Industry Classification System
NBP	NO_x budget trading program
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NH_3	ammonia
NNSR	nonattainment new source review
NO	nitrogen oxide
NO_x	nitrogen oxides
NSNCR	nonselective noncatalytic reduction
NSPS	new source performance standards
NSR	new source review
O_2	oxygen
OAQPS	Office of Air Quality Planning and Standards
PFR	parallel flow regenerative
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
ppb	part per billion
ppm	part per million
PSD	prevention of significant deterioration
PTE	potential to emit
RACT	reasonably available control technology
RBLC	RACT/BACT/LAER Clearinghouse
SCR	selective catalytic reduction
SER	significant emissions rate
SIC	Standard Industrial Classification
SIL	significant impact level
SIP	state implementation plan
SNCR	selective noncatalytic reduction
SO_2	sulfur dioxide
tpd	ton per day
tph	ton per hour
tpy	ton per year
TSP	total suspended particulates
VE	visible emissions
VOC	volatile organic compound

1.0 INTRODUCTION AND SUMMARY

1.1 INTRODUCTION

Carmeuse Lime & Stone (Carmeuse) and Keystone Properties, LLC (Keystone), are entering into a joint venture agreement to construct and operate a lime manufacturing operation in Jacksonville, Florida. The joint venture is hereinafter referred to as Jacksonville Lime, LLC (Jacksonville Lime). Primary equipment at the proposed facility includes two parallel flow regenerative (PFR) vertical lime kilns and associated raw material, product, and fuel handling systems. With the application of heat, the kilns will calcine limestone (primarily, calcium carbonate but may also contain magnesium carbonate) into lime (calcium oxide). The process will also generate carbon dioxide (CO_2) as a by-product. Section 2.2 describes the various processes associated with the proposed operations at Jacksonville Lime in more detail.

The plant's primary Standard Industrial Classification (SIC) code is 3274, Lime, and the plant's North American Industry Classification System (NAICS) code is 327410, Lime Manufacturing.

Jacksonville Lime will have the potential to emit (PTE) greater than 100 tons per year (tpy) of several criteria pollutants. A source is major under the federal Prevention of Significant Deterioration (PSD) regulations if its PTE is greater than 250 tpy for any criteria pollutant, unless it is one of the 28 named source categories that are subject to a lower major source threshold of 100 tpy. Since lime plants are one of the 28 named source categories, the facility will be classified as a new major source with respect to the federal PSD permitting program. The facility will also be a new major source with respect to the federal Title V permitting program and a major source of hazardous air pollutants (HAPs).

Following this introduction section, Volume 1 of this PSD permit application is organized as follows:

- Section 2.0 describes the proposed facility, processes, and associated air emissions and stack parameters.

- Section 3.0 outlines state and federal regulatory requirements applicable to the proposed project.
- Section 4.0 presents the best available control technology (BACT) analysis and proposed BACT for applicable emissions units and pollutants.

Volume 2 of this PSD permit application contains the air quality modeling and other impacts analysis:

- Section 5.0 describes the Class II modeling methodology and the data used.
- Section 6.0 presents the results of an air quality impact analysis (dispersion modeling) for Class II areas surrounding the proposed facility.
- Section 7.0 describes the methodology and data used and presents the results of the air quality impact analyses for Class I areas within 300 kilometers (km) from the proposed facility.
- Section 8.0 discusses the additional impacts resulting from the construction and operation of the facility (such as growth and air impacts on soils, vegetation, and wildlife).
- Section 9.0 provides the references used in the studies in the preparation of this permit application package.

1.2 SUMMARY

The proposed project will result in emissions of carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter (PM), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), volatile organic compounds (VOCs), and greenhouse gases (GHGs). Since CO, NO_x, SO_2, PM, PM_{10}, and $PM_{2.5}$ emissions each exceed their respective PSD significant emissions rates (SERs), the proposed project is subject to PSD review for those pollutants. Therefore, this application package is submitted to satisfy the PSD permitting requirements and obtain a permit to commence construction.

The proposed project also exceeds the major source thresholds for GHGs as carbon dioxide equivalents (CO_2e). A separate permit application was previously submitted in June 2012 to the U.S. Environmental Protection Agency (EPA), Region 4, with a copy to the Florida Department Environmental Protection (FDEP).

2.0 DESCRIPTION OF THE PROPOSED FACILITY

2.1 FACILITY LOCATION

The proposed Jacksonville Lime facility is located on Keystone's property situated on the west bank of the St. Johns River in an industrialized section of Jacksonville, Florida. The physical address for the facility is 1915 Wigmore Street, Jacksonville, Duval County, Florida. The property consists of approximately 110 acres of land situated on both sides of Wigmore Street. The main parcel on which the kilns are to be situated is comprised of approximately 100 acres, and a second parcel of approximately 10 acres is located across Wigmore Street from the main parcel. The property had been used as a kraft linerboard mill and manufacturing facility from 1938 until 2006. A chain-linked fence is located along the southern, western, and northern boundaries of the property so as to restrict the site from public access. One of JEA's peaking unit power plants is located adjacent to the project site on the southern boundary. A mixture of both commercial and residential properties surrounds the western and northwestern boundaries. Residential housing is located approximately 450 feet (ft) north of the developed portion of the site. The St. Johns River, which runs along the northeastern and eastern boundaries, serves as a natural barrier for the property. Figure 2-1 shows the general location of the subject property and surrounding areas. Figure 2-2 provides the layout of the Keystone property and the proposed Jacksonville Lime facility showing the lime kilns and related material handling equipment. Figure 2-3 provides a more detailed site layout of the Jacksonville Lime facility.

As previously mentioned, the site had previously been used as a kraft linerboard mill and manufacturing facility from 1938 until 2006. Shortly after purchasing the property in early 2006, Keystone initiated negotiations with FDEP concerning the desirability of having the property designated as a brownfield site pursuant to Florida's Brownfields Program. Negotiations between Keystone and FDEP were complicated by the ongoing eminent domain action taken by Jacksonville Port Authority against Keystone. A brownfields site rehabilitation agreement (BSRA) was agreed to and signed by FDEP and Keystone in July 2007. Figures 2-4 and 2-5 provide aerial photographs of the site as a former manufacturing facility (1950s) and the site's postredevelopment view (2011), respectively.

M:\acad\120604\Site_Location.mxd NAD 1983 StatePlane Florida East FIPS 0901 FeetTransverse Mercator ndenahan 8/21/2013 11:05:21 AM

FIGURE 2-1.
LOCATION MAP (2011AERIAL)

Sources: ESRI, 2011; ECT, 2013.

ECT Environmental Consulting & Technology, Inc.

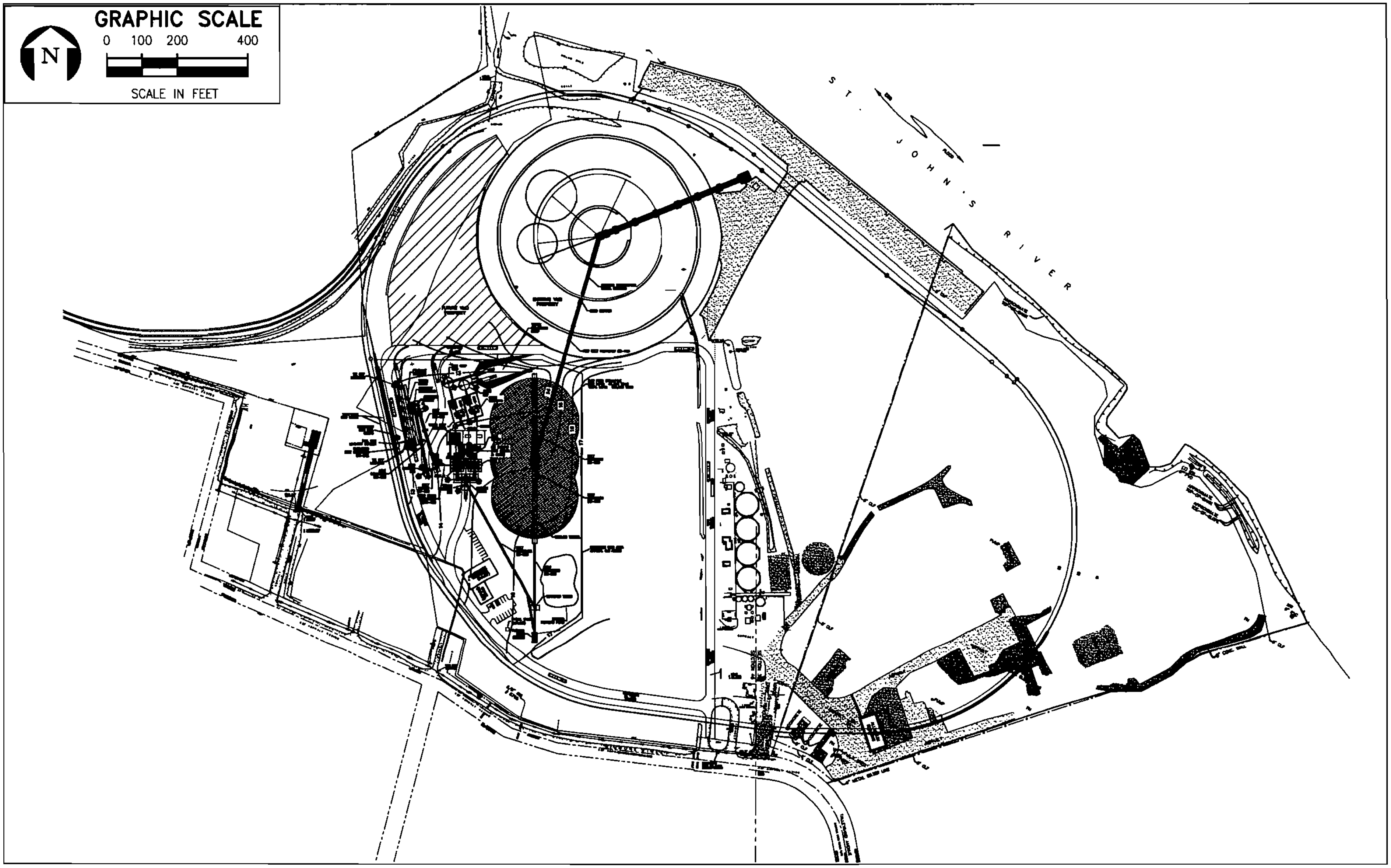


FIGURE 2-2.
OVERALL SITE LAYOUT

Sources: LB&W Engineering, Inc., 2013; ECT, 2013.

ECT Environmental Consulting & Technology, Inc.

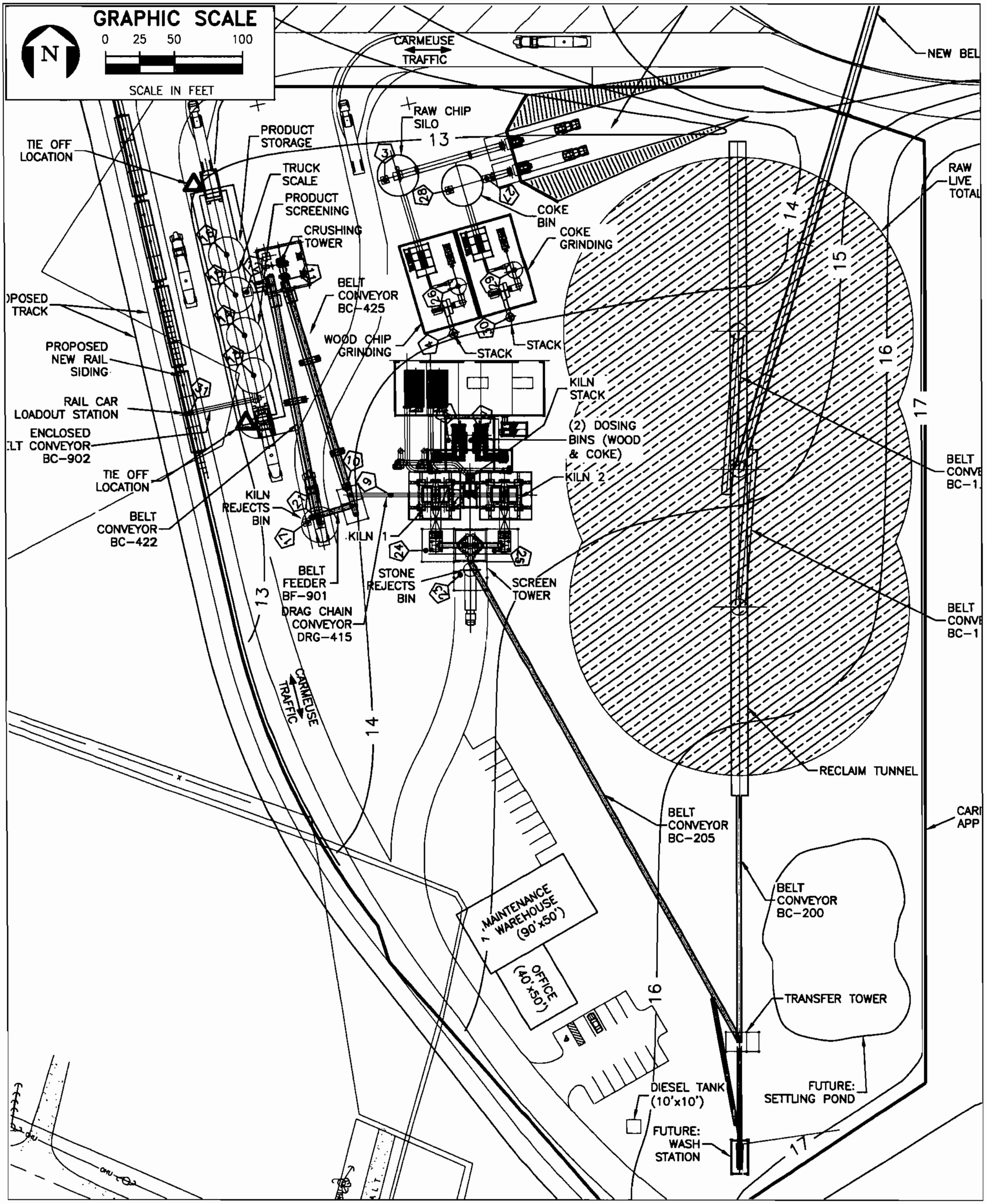


FIGURE 2-3.

DETAILED SITE LAYOUT

Sources: LB&W Engineering, Inc., 2013; ECT, 2013.

ECT Environmental Consulting & Technology, Inc.

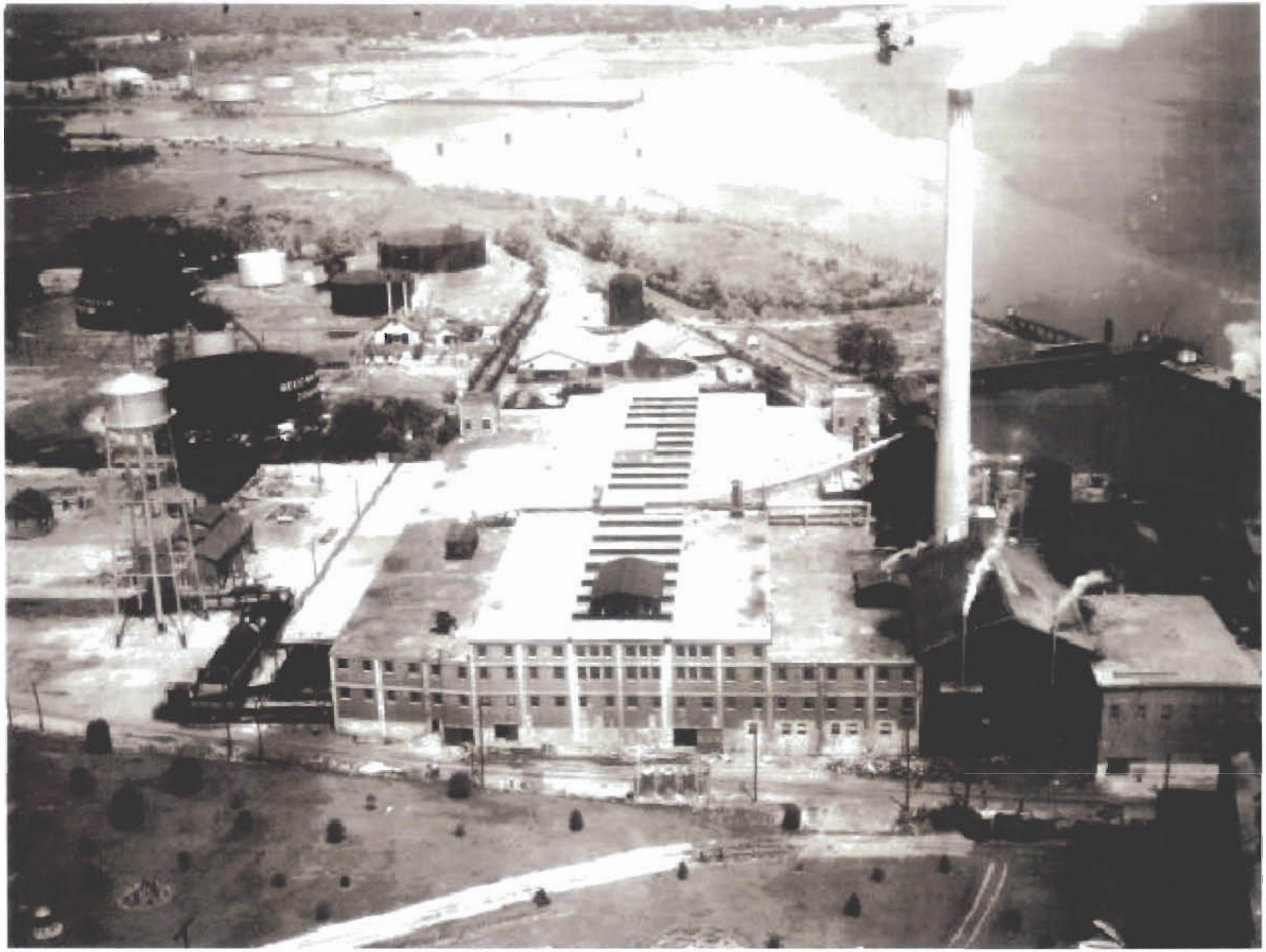


FIGURE 2-4.

FORMER MANUFACTURING OPERATION AERIAL PHOTOGRAPH (1950s)

Source: ECT, 2012.

ECT Environmental Consulting & Technology, Inc.

FIGURE 2-5.

POSTREDEVELOPMENT AERIAL PHOTOGRAPH (2011)

Source: ECT, 2012.

ECT Environmental Consulting & Technology, Inc.

2.2 PROCESS DESCRIPTION

Limestone is a naturally occurring sedimentary rock containing predominantly calcium carbonate ($CaCO_3$) but may also contain magnesium carbonate ($MgCO_3$). Rock that contains 5 percent or less $MgCO_3$ is used to produce high calcium lime. Rock containing 35 to 46 percent $MgCO_3$is referred to as dolomite, or dolomitic limestone ($CaCO_3 \bullet MgCO_3$).

High calcium lime (i.e., calcium oxide [CaO]) and dolomitic lime ($CaO \bullet MgO$) are produced by the high temperature (approximately 1,850 to 2,190 degrees Fahrenheit [°F]) thermal decomposition (i.e., calcination) of limestone or dolomitic limestone to lime and CO_2 as shown by the following reactions:

$$CaCO_3 + \text{heat} \rightarrow CaO + CO_2(g) \quad (1)$$

$$CaCO_3 \bullet MgCO_3 + \text{heat} \rightarrow CaO \bullet MgO + 2CO_2(g) \quad (2)$$

where: $CaCO_3 \bullet MgCO_3$ = dolomitic limestone.
$CaCO_3$ = calcium carbonate.
CaO = high calcium lime.
$CO_2(g)$ = gaseous carbon dioxide.
$CaO \bullet MgO$ = dolomitic lime.

The basic processes in the production of lime are:

- Quarrying raw limestone.
- Preparing limestone for calcination by crushing and sizing.
- Calcining limestone in kilns.
- Miscellaneous raw material and product transfer, storage, and handling operations.

The two proposed kilns are each designed to produce a nominal 330 tons per day (tpd) of lime per kiln, with a maximum lime production rate of up to 396 tpd per kiln. Although the kilns are expected to operate 24 hours per day and 357 days per year, Jacksonville Lime wishes to have the flexibility of operating continuously (i.e., 365 days per year, 8,760 hours per year) for permitting purposes.

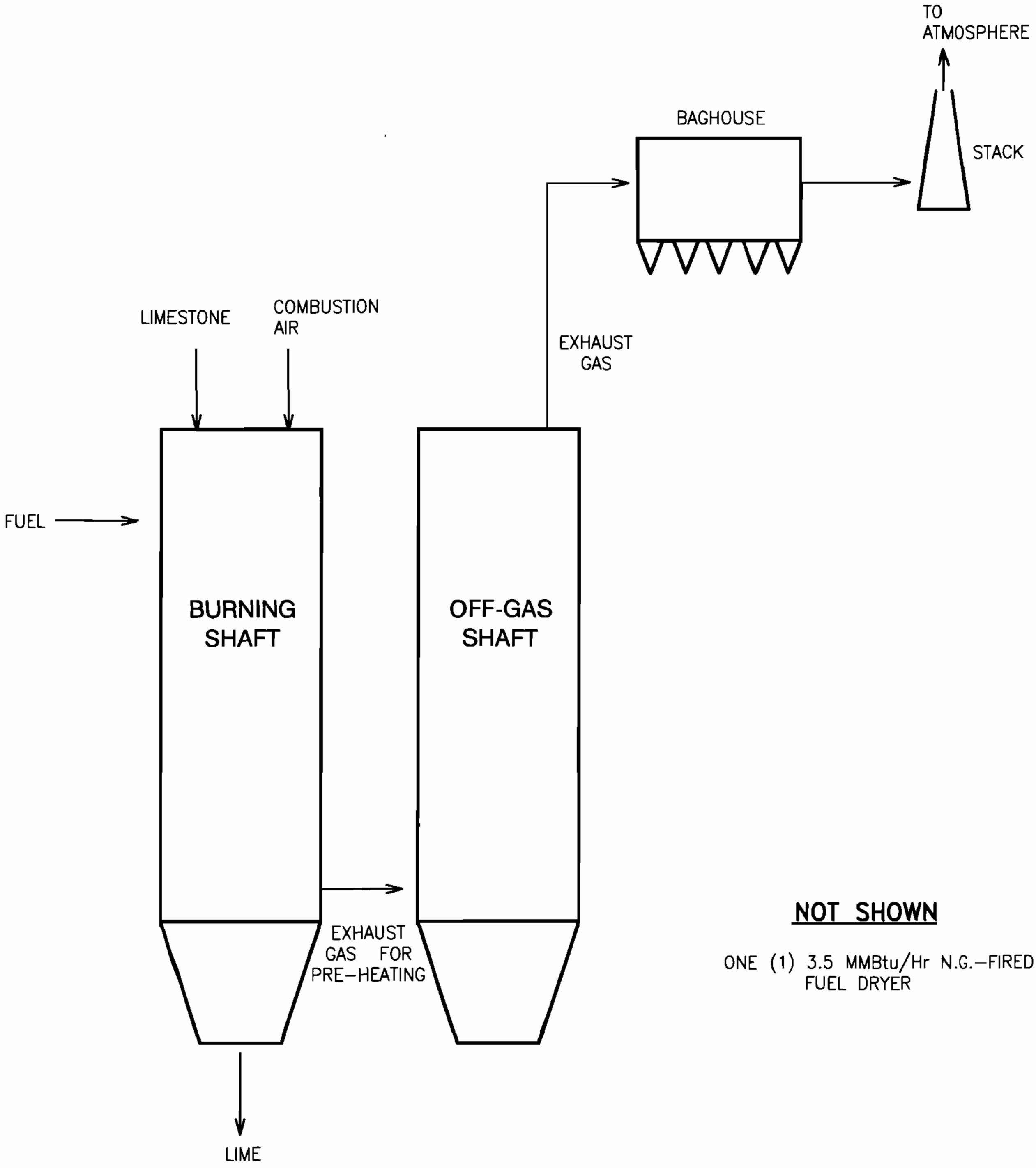
Figure 2-6 illustrates a typical PFR vertical lime kiln, and Figure 2-7 depicts the overall facility process flow including material handling equipment. Appendix A contains more detailed process flow diagrams.

2.2.1 LIMESTONE HANDLING

Unprocessed limestone will be delivered to the Keystone property from an offsite quarry and will be conveyed via stacker conveyor to a surge hopper on the Jacksonville Lime property. Material will then be diverted to a series of belt conveyors and sent to live storage piles. From this point, an enclosed (tunnel) belt conveyor will be fed from the live storage piles with pan feeders to deliver the stone to a transfer conveyor and screen. The screen will segregate the limestone according to size, with finer material being delivered to a 65-ton reject bin and kiln feed stone delivered to two 120-ton charging bins. The limestone handling and sizing operations will be controlled with wet suppression. The screen and charging bins will be enclosed. From the charging bins, the kiln feed will be transferred via belt conveyors and skip hoists to the kiln feed surge bins. Emissions from the surge bins and transfer points will be controlled by fabric filter dust collectors. From the surge bins, kiln feed stone will be delivered via pan feeder to two 20-ton storage bins. The surge bins and associated material transfer points will be enclosed. The surge bins will feed limestone to the two proposed vertical kilns.

2.2.2 FUEL HANDLING

The proposed PFR kilns are designed to produce lime that meets customer quality specifications at competitive prices based on market demand. As such, they are designed to accommodate various fuels to achieve economic viability and satisfy multiple markets with varying quality demands. Five kiln fuel options are proposed for this project, namely petroleum coke or petcoke (primary), coal, lignite, natural gas, and wood chips (as available). In the event that a single fuel becomes cost prohibitive, the proposed configuration will allow the facility to pursue fuel that is more economically viable, as opposed to producing a product that is too expensive for the market or idling operations. Nominal fuel consumption rates per kiln are 1.8 tons per hour (tph) for petcoke, 1.9 tph for coal, 3.4 tph for lignite, 786 cubic feet per minute (ft^3/min) for natural gas, and 2.9 tph for wood chips.



NOT SHOWN

ONE (1) 3.5 MMBtu/Hr N.G.–FIRED FUEL DRYER

NOTES:
1. PARALLEL FLOW SHAFTS ALTERNATE BETWEEN BURNING MODE & OFF–GAS (PRE–HEATING) MODE FOR INCREASED ENERGY EFFICIENCY.
2. ONE (1) PARALLEL FLOW REGENERATIVE LIME KILN SHOWN. TWO (2) TOTAL.

FIGURE 2-6.

SIMPLIFIED PROCESS FLOW DIAGRAM
(VERTICAL PFR LIME KILN)

Source: ECT, 2010.

ECT Environmental Consulting & Technology, Inc.

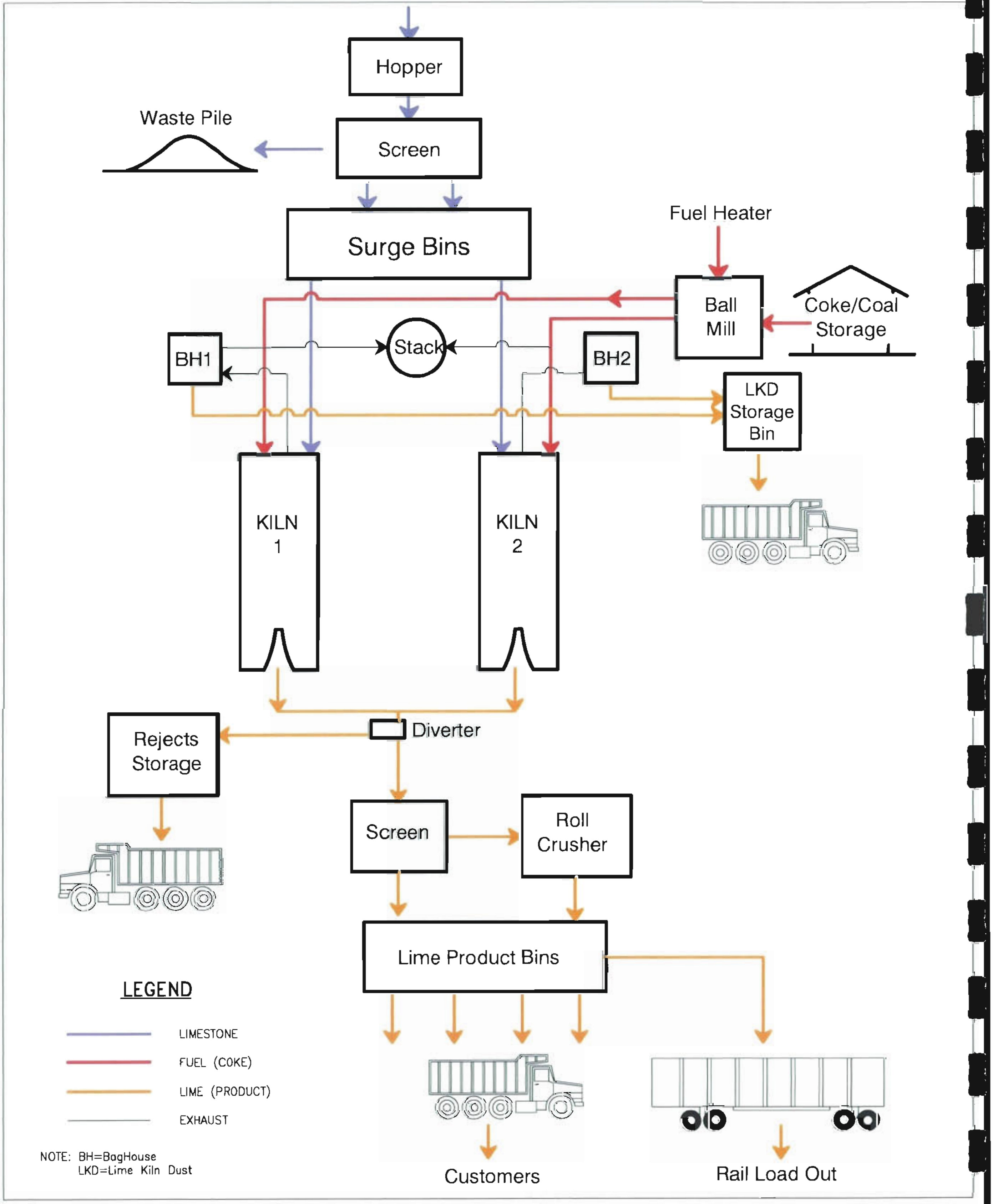


FIGURE 2-7.

SIMPLIFIED PROCESS FLOW DIAGRAM
(OVERALL FACILITY)

Source: ECT, 2013.

ECT Environmental Consulting & Technology, Inc.

Petcoke/coal will be loaded into a dump hopper by truck and/or front-end loaders and sent to a 500-ton coke/coal bin via belt conveyor. The petcoke/coal in the coke bin is unloaded onto a weighing belt feeder, which sends the petcoke to a bowl mill to dry and size the fuel prior to being combusted in the limestone kilns. Air for the mill to dry the petcoke/coal is preheated with a natural gas-fired heater, rated at 3.5 million British thermal units per hour (MMBtu/hr). The high temperature flue gases from a 3.5-MMBtu/hr natural gas-fired heater will be used to dry the fuel by direct contact. The milled petcoke/coal and air are sent through a classifier and collected in a dust collector. The milled petcoke/coal collected in the dust collector is transferred via a pneumatic conveyor to a 50-ton petcoke/coal bin. The milled fuel is combined and pressurized in smaller bins for feed into the vertical lime kilns. Emissions from the proposed petcoke/coal bins and processing equipment are controlled by three fabric filter dust collectors.

Wood-derived fuel will be loaded into a dump hopper by front-end loaders and/or dump trucks and sent to a 168-ton raw storage bin via belt conveyor. The wood-derived fuel in the raw storage bin is transferred via a drag chain conveyor to a mill. The milled wood fuel is collected in a dust collector and pneumatically conveyed to a 50-ton ground chip storage bin. The milled fuel is combined and pressurized in smaller bins for feed into the vertical lime kilns. Emissions from the proposed wood-derived fuel storage bins and processing equipment are controlled by three fabric filter dust collectors.

2.2.3 VERTICAL KILNS

In a lime kiln, limestone is calcined to produce lime and CO_2. The kiln must be operated at high temperatures for this reaction to take place. Jacksonville Lime is proposing to construct two vertical lime kilns, nominally rated at 330 tpd of lime product per kiln. The proposed vertical kilns are PFR-type kilns. The kilns each have two vertical shafts that are connected by a cross-over channel. In this style of kiln, heated limestone and hot combustion gases flow parallel in one shaft (the burning shaft). Simultaneously in the other shaft (the nonburning shaft), the hot lime product and combustion gases flow countercurrent to the raw limestone.

In the burning shaft, combustion air is introduced under pressure at the top of the preheating zone above the limestone bed. The complete system is pressurized. The combustion air is preheated by hot limestone in the regenerator (preheating zone) prior to mixing with the fuel. The air/fuel flame is in direct contact with the calcining limestone as it passes through the burning zone from top to bottom (parallel flow heating).

The off-gases leave the burning shaft and enter the nonburning shaft through the cross-over channel, travelling up in counter flow to the raw limestone. The off-gases transfer heat to the limestone in the nonburning shaft and even calcine it to a small degree. The off-gases then regenerate the limestone bed in the preheating zone of the burning shaft in preparation for the next burning cycle on that particular shaft.

These shafts cycle between burning and nonburning modes every 10 to 15 minutes. The vertical kilns will be direct fired and use petcoke containing approximately 5.2 percent sulfur by weight as the primary fuel. The kilns will also be capable of firing coal, lignite, natural gas, and wood chips. The preheating of limestone by the hot kiln exhaust gas results in increased thermal efficiency for vertical kilns when compared to rotary kilns. Therefore, the amount of fuel needed per ton of lime product is less when compared to a rotary kiln. The vertical kilns operate under pressure, which reduces the residence time and temperature necessary for calcining limestone. Parallel flow results in lower burning zone temperatures, subsequently contributing to less thermal NO_x formation. By routing the calcining chamber exhaust gases through the limestone feed preheating chamber, additional control of SO_2 can be obtained, as the SO_2 is adsorbed onto the limestone raw material. Appendix B provides technical literature describing the operation of a typical PFR vertical kiln.

Once the exhaust gas exits the kiln feed preheat chamber, it is routed to a dust collector. Each vertical kiln is equipped with a dedicated fabric filter dust collector. The kiln dust collected in the dust collectors will be pneumatically conveyed for reinjection into the vertical kilns. During episodes of startup and shutdown when the vertical kiln dust is not representative of typical product, the material will be transferred to a portable tote container for disposal.

2.2.4 LIME HANDLING

The lime exiting the vertical kilns is released into one of the two dedicated 18-ton hoppers per kiln (two per kiln chamber). The hoppers transfer the product to a drag chain conveyor. PM emissions due to lime product transfers from the hoppers to the drag chain conveyors below will be controlled by fabric filter dust collectors. From the product belt conveyor, the lime is transferred through a series of transfer chutes and additional conveyors, all of which employ dust collection systems. The lime product will then be directed to a screen and roll crusher prior to transfer of the final product to storage silos. The screen, roll crusher, transfer points, and associated dust collector are enclosed within a building.

Reject material from product lime processing is routed to the reject material handling system. The reject material handling system is comprised of a reject bin belt conveyor, 230-ton reject bin, and associated equipment including load-out, roll crusher, crusher product screw conveyor, and bucket elevators.

The segregated final product is directed to one of four 500-ton product storage bins, each equipped with a self-contained dustless truck loading spout. PM emissions resulting from the various product transfers is captured and controlled by fabric filter dust collection systems at various locations. These dust collection systems have high control efficiencies and are effective in controlling PM emissions. The silo truck loadout area is also enclosed.

2.3 EMISSIONS RATES

To summarize, air emissions sources at the proposed Jacksonville Lime include two PFR lime kilns; miscellaneous raw material, fuel, and product handling, processing, and storage operations; and one natural gas-fired 3.5-MMBtu/hr fuel dryer.

Table 2-1 presents the potential annual emissions from these sources. Appendix C presents the basis for these emissions estimates and emissions calculations. Additional information may be found in the FDEP permit application forms, found in Appendix D.

Table 2-1. Potential Annual Emissions from Proposed Jacksonville Lime

Pollutant	Kilns 1 and 2	Miscellaneous PM Sources	Fuel Dryer	Facility Totals
<u>Criteria Pollutants</u>				
NO_x	343.3	N/A	1.4	344.7
SO_2	180.1	N/A	2.2E-02	180.1
PM	24.9	19.9	N/A	36.6
PM_{10}	41.6	19.9	N/A	61.5
$PM_{2.5}$	41.6	9.9	N/A	51.5
CO	411.9	N/A	0.6	412.5
VOCs	19.2	N/A	0.1	19.3
Lead	0.01	N/A	Negligible	0.01
<u>HAPs</u>	21.5	N/A	Negligible	21.5
Hydrogen chloride	2.7	N/A	Negligible	2.7
Hydrogen fluoride	1.5E-03	N/A	Negligible	1.5E-03
Mercury	24.2	N/A	Negligible	24.2
Total HAPs				
<u>Other Pollutants</u>	1.6	N/A	Negligible	1.6
Sulfuric acid mist	357,014	N/A	1,793.6	357,014
CO_2				

Note: N/A = not applicable.

Sources: Jacksonville Lime, 2013.
ECT, 2013.

3.0 REGULATORY REQUIREMENTS

3.1 AMBIENT AIR QUALITY STANDARDS

As a result of the 1977 Clean Air Act (CAA) Amendments (1990), EPA has enacted primary and secondary national ambient air quality standards (NAAQS) for six air pollutants (Chapter 40, Part 50, Code of Federal Regulations [CFR]). Primary NAAQS are intended to protect the public health, and secondary NAAQS are intended to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Florida repealed its ambient air quality standard (AAQS) on February 16, 2012, and adopted the NAAQS by reference. Table 3-1 presents the current NAAQS.

Areas of the country where ambient air quality does not meet the AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements. The proposed Jacksonville Lime project will be located in Duval County. Duval County currently has no nonattainment areas. However, the county is an ozone maintenance area and partly a PM maintenance area as defined by the following boundary lines: south and then west along the St. Johns River from its confluence with Long Branch Creek to Main Street, north along Main Street to Eight Street, east along Eighth Street to Evergreen Avenue, north along Evergreen Avenue to Long Branch Creek, and east along Long Brach Creek to the St. Johns River. Duval County is designated as unclassifiable for PM_{10} and SO_2. The unclassifiable designation means that there is insufficient data to prove that the area has attained the standards, but limited data supports that it has achieved them.

For permitting purposes, the maintenance and unclassifiable areas are treated as attainment areas. Accordingly, Jacksonville Lime is not subject to federal nonattainment new source review (NNSR) permitting requirements.

Table 3-1. National and Florida AAQS

Pollutant (units)	Averaging Periods	National and Florida Standards	
		Primary	Secondary
SO_2 (ppb)	1-hour*	75	
	3-hour†		500
PM_{10} (μg/m^3)	24-hour§	150	150
$PM_{2.5}$ (μg/m^3)	24-hour**	35	35
	Annual††	12	15
CO (ppm)	1-hour†	35	
	8-hour†	9	
Ozone (ppmv)	8-hour§§	0.075	0.075
NO_2 (ppb)	1-hour**	100	
	Annual☼	53	53
Lead (μg/m^3)	Rolling 3-month average	0.15	0.15

Note: μg/m^3 = microgram per cubic meter.
ppb = part per billion.
ppm = part per million
ppmv = part per million by volume.

*99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
†Not to be exceeded more than once per year.
§Not to be exceeded more than once per year on average over 3 years.
**98th percentile, averaged over 3 years.
††Annual arithmetic mean, averaged over 3 years.
§§Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
☼Annual arithmetic mean.

Sources: 40 CFR 50.
ECT, 2013.

3.2 PREVENTION OF SIGNIFICANT DETERIORATION

3.2.1 PSD APPLICABILITY AND OVERVIEW

PSD regulations, codified in 40 CFR 52.21, are new source review (NSR) preconstruction permitting requirements that apply to major stationary sources and major modifications in attainment areas. Florida has an EPA-approved NSR program in its state implementation plan (SIP), which can be found in Section 62-212.400, Florida Administrative Code (F.A.C.).

Major sources are those with a PTE of 100 tpy or more of any regulated pollutant for the 28 listed types of sources, or those with a PTE 250 tpy or more any such pollutant. PTE means the capability of emitting a pollutant at maximum design capacity and after the application of control equipment. Jacksonville Lime is one of the 28 listed source types and will have potential emissions greater than 100 tpy for NO_x, SO_2, and CO. In addition, since the facility has a PTE of 75,000 tpy or more of GHGs and is major for one or more non-GHG pollutants, GHGs are also subject to PSD requirements. As such, it is subject to the PSD NSR requirements for those pollutants that are emitted at or above the specified PSD SER incorporated in Rule 62-212.200(278), F.A.C. Table 3-2 provides comparisons of estimated potential annual emissions rates for Jacksonville Lime and the PSD SER thresholds. As shown in this table, potential emissions of NO_x, SO_2, PM, PM_{10}, $PM_{2.5}$, and CO are each projected to exceed the applicable PSD SER. These pollutants are, therefore, subject to the PSD NSR requirements. Appendix C contains detailed emissions rate calculations.

PSD NSR is intended to determine whether significant air quality deterioration will result from a new or modified major source. Major components of a PSD NSR include control technology review, ambient impact analysis, ambient air quality monitoring (if necessary), and additional impact analyses.

3.2.2 CONTROL TECHNOLOGY REVIEW

Pursuant to Rule 62-212.400(4)(c), F.A.C., an analysis of BACT is required for each pollutant emitted by the major source in amounts equal to or greater than the PSD SER levels shown in Table 3-2. According to Rule 62-210.200(40), F.A.C., BACT is defined as:

Table 3-2. Jacksonville Lime Emissions Compared to PSD SERs

Pollutant	Projected Maximum Annual Emissions (tpy)	PSD SER (tpy)	PSD Applicability
NO_x	343	40	Yes
CO	412	100	Yes
PM	81	25	Yes
PM_{10}	81	15	Yes
$PM_{2.5}$ (direct)	41	10	Yes
SO_2	180	40	Yes
Ozone (VOC)	19	40	No
Lead	0.06	0.6	No
Mercury	0.004	0.1	No
Total fluorides	2.7	3	No
Sulfuric acid mist	1.6	7	No
GHG (as CO_2e)	357,014	75,000	Yes
Total reduced sulfur (including hydrogen sulfide)	Not present	10	No
Reduced sulfur compounds (including hydrogen sulfide)	Not present	10	No
Municipal waste combustor acid gases (measured as SO_2 and hydrogen chloride)	Not present	40	No
Municipal waste combustor metals (measured as PM)	Not present	15	No
Municipal waste combustor organics (measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	Not present	3.5×10^{-6}	No
For the pollutants listed in this table and for major stationary sources located within 10 km of a Class 1 area having an impact equal to or greater than 1 $\mu g/m^3$, 24-hour average	N/A	Any amount	No

Sources: Rule 62-210.200(282), F.A.C.
Jacksonville Lime, 2013.
ECT, 2013.

> "an emissions limitation, including a visible emissions standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, determines if achievable through application of production processes and available methods, systems and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant, taking into account: 1. Energy, environmental, and economic impacts, and other costs; 2. All scientific, engineering, and technical material and other information available to the Department; and (3) The emissions limiting standards or BACT determinations of Florida and any other state."

BACT determinations are made on a case-by-case basis using a *top-down* approach, which was outlined in a December 1, 1987, memorandum from Craig Porter, EPA Assistant Administrator, to EPA Regional Administrators on the subject of *Improving New Source Review Implementation.* Using this approach, available control technology alternatives are identified based on knowledge of the particular industry of the applicant and previous control technology permitting decisions for other identical or similar sources. These alternatives are rank-ordered by stringency; and this hierarchy is evaluated starting with the top or the most stringent alternative to determine economic, environmental, and energy impacts and assess the feasibility or appropriateness of each alternative as BACT based on site-specific factors. If the top control technology alternative is not applicable or technically or economically infeasible, it is rejected as BACT, and the next most stringent alternative is considered. This process of evaluation continues until an applicable control technology alternative is deemed to be both technologically and economically feasible, thereby defining the emissions level associated with this technology as BACT. This top-down procedure for conducting BACT analyses is also described in Chapter B of EPA's Draft New Source Review Manual dated October 1990.

BACT is typically defined in terms of a numerical emissions limit. This numerical emissions limit can be based on the application of air pollution control equipment; specific production processes, methods, systems, or techniques; fuel cleaning; or combustion techniques. Because each applicable pollutant must be analyzed, emissions units may undergo BACT analysis for more than one pollutant.

The BACT emissions limits established during the initial permitting process will be enforceable over the life of the unit. As a result, the BACT analysis must take into account the full range of possible fuels, operating conditions, operating system fluctuations, and normal wear-and-tear on the units and control systems. EPA's Environmental Appeals Board (EAB) has recognized that "permitting agencies have the discretion to set BACT limits at levels that do not necessarily reflect the highest possible control efficiencies but, rather will allow permittees to achieve compliance on a consistent basis" (Three Mountain Power, PSD Appeal No. 01-05 at 21 [May 30, 2001] citing: In re Masonite Corp., 5 E.A.D. 560-61 [EAB 1994] ["There is nothing inherently wrong with setting an emissions limitation that takes into account a reasonable safety factor."]; and In re Knauf Fiber Glass, GmbH, PSD Appeal Nos. 99-8 to –72, slip op. at 21 [EAB, Mar. 14, 2000] ["The inclusion of a reasonable safety factor in the emissions limitation is a legitimate method of deriving a specific emissions limitation that may not be exceeded."]).

3.2.3 AMBIENT AIR QUALITY MONITORING

In accordance with the PSD requirements of Rule 62-212.400(7), F.A.C., any application for a PSD permit must contain, for each pollutant subject to review, an analysis of ambient air quality data in the area affected by the proposed major stationary source or major modification. The affected pollutants are those that the source would potentially emit in significant amounts (i.e., those that exceed the PSD SER thresholds shown in Table 3-2).

Preconstruction ambient air monitoring for a period of up to 1 year is generally required. Existing data from the vicinity of the proposed source may be used if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided by EPA's Ambient Monitoring Guidelines for PSD (1987a).

Rule 62-212.400(3)(e), F.A.C., provides an exemption that excludes or limits the pollutants for which an air quality monitoring analysis is conducted. This exemption states that a proposed facility will be exempt from the monitoring requirements of Rule 62-212.400(7), F.A.C., with respect to a particular pollutant if the emissions increase of the pollution from the new source would cause, in any area, air quality impacts less than the PSD *de minimis* ambient impact levels presented in Rule 62-212.400(3)(e)1., F.A.C. (see Table 3-3). In addition, an exemption may be granted if the air quality impacts due to existing sources in the area of concern are less than the PSD *de minimis* ambient impact levels.

Section 5.4 discusses the applicability of the PSD preconstruction ambient monitoring requirements to Jacksonville Lime.

3.2.4 AMBIENT IMPACT ANALYSIS

An air quality or source impact analysis must be performed for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the SERs previously shown in Table 3-2. FDEP requires the use of applicable EPA atmospheric dispersion models in determining estimates of ambient concentrations. Guidance for the use and application of dispersion models is presented in the EPA Guideline on Air Quality Models (GAQM), as published in Appendix W to 40 CFR 51. Criteria pollutants may be exempt from the full source impact analysis if the net increase in impacts due to the new source or modification is below the appropriate Rule 62-210.200(283), F.A.C., significant impact level (SIL), as presented in Table 3-4. EPA has proposed SILs for Class I areas—Table 3-5 provides these levels.

Ozone is one pollutant for which a source impact analysis is not normally required. Ozone is formed in the atmosphere as a result of complex photochemical reactions. Models for ozone generally are applied to entire urban areas.

Various lengths of record for meteorological data can be used for impact analyses. A 5-year period can be used with corresponding evaluation of the highest of the second-highest (HSH) short-term concentrations for comparison to AAQS or PSD increments. The term *highest, second-highest* refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term PSD increments specify the standard should not be exceeded at any location more than once per year. If less than

Table 3-3. PSD *De Minimis* Ambient Impact Levels

Averaging Time	Pollutant	*De Minimis* Level ($\mu g/m^3$)
Annual	NO_2	14
Quarterly	Lead	0.1
24-Hour	PM_{10}	10
	$PM_{2.5}$	4
	SO_2	13
	Mercury	0.25
	Fluorides	0.25
8-Hour	CO	575
1-Hour	Total reduced sulfur	10
	Hydrogen sulfide	0.2
	Reduced sulfur compounds	10
NA	Ozone	100 tpy of VOC emissions

Source: Rule 62-212.400(3)(e)1., F.A.C.

Table 3-4. Florida's SILs

Pollutant	Averaging Period	Concentration ($\mu g/m^3$)
SO_2	Annual	1
	24-Hour	5
	24-Hour (Class I Areas)	1
	3-Hour	25
	1-Hour (Interim)	7.8
PM_{10}	Annual	1
	24-Hour	5
	24-Hour (Class I Areas)	1
$PM_{2.5}$	Annual	0.3
	Annual (Class I Areas)	0.06
	24-Hour	1.2
	24-Hour (Class I Areas)	0.07
NO_2	Annual	1
	1-Hour (Interim)	7.5
CO	8-Hour	500
	1-Hour	2,000
Lead	Quarterly	0.03

Source: Rule 62-210.200(283), F.A.C.

Table 3-5. EPA SILs—Class I Areas

Pollutant	Averaging Period	Concentration ($\mu g/m^3$)
SO_2	Annual	0.1
	24-Hour	0.2
	3-Hour	1.0
PM_{10}	Annual	0.2
	24-Hour	0.3
$PM_{2.5}$	Annual	0.06
	24-Hour	0.07
NO_2	Annual	0.1

Source: EPA Proposed, 1996; 61 FR 38249.
40 CFR 52.52 ($PM_{2.5}$)
40 CFR 51.166

5 years of meteorological data are used, the highest concentration at each receptor must be used.

In promulgating the 1977 CAA Amendments, Congress specified that certain increases above an air quality baseline concentration level for SO_2 and total suspended particulates (TSP) would constitute significant deterioration. The magnitude of the increment that cannot be exceeded depends on the classification of the area in which a new source (or modification) will have an impact. Three classifications were designated based on criteria established in the CAA Amendments. Initially, Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 2,024 hectares [ha] [5,000 acres], and national parks larger than 2,428 ha [6,000 acres]) or Class II (all other areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. However, the states were given the authority to redesignate any Class II area to Class III status, provided certain requirements were met. EPA then promulgated, as regulations, the requirements for classifications and area designations.

On October 17, 1988, EPA promulgated PSD increments for NO_2; the effective date of the new regulation was October 17, 1989. However, the baseline date for NO_2 increment consumption was set at February 8, 1988; new major sources or modifications constructed after this date will consume NO_2 increment.

On June 3, 1993, EPA promulgated PSD increments for PM_{10}; the effective date of the new regulation was June 3, 1994. The increments for PM_{10} replace the original PM increments that were based on TSP. Baseline dates and areas that were previously established for the original TSP increments remain in effect for the new PM_{10} increments. Revised NAAQS for PM, which include revised NAAQS for PM_{10} and $PM_{2.5}$, became effective on October 17, 2006. On October 2, 2010, EPA promulgated PSD $PM_{2.5}$ increments, SILs, and significant monitoring concentrations. New sources and changes at existing sources occurring after the $PM_{2.5}$ increment effective date of December 20, 2010, will consume/expand $PM_{2.5}$ increments.

Florida repealed its PSD allowable increments in Section 62-204.260, F.A.C., on February 16, 2012, and adopted the federal increments by reference (see Table 3-6).

The term baseline concentration evolved from federal and state PSD regulations and denotes a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition in the PSD regulations, as amended, *baseline concentration* means the ambient concentration level that exists in the baseline area at the time of the applicable minor source baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established based on:

- The actual emissions representative of sources in existence on the applicable minor source baseline date.
- The allowable emissions of major stationary sources that commenced construction before the major source baseline date but were not in operation by the applicable minor source baseline date.

The following will not be included in the baseline concentration and will affect the applicable maximum allowable increase(s) (i.e., allowed increment consumption):

- Actual emissions from any major stationary source on which construction commenced after the major source baseline date.
- Actual emissions increases and decreases at any stationary source occurring after the minor source baseline date.

It is not necessary to make a determination of the baseline concentration to determine the amount of PSD increment consumed. Instead, increment consumption calculations need only reflect the ambient pollutant concentration *change* attributable to emissions sources that affect increment. *Major* source baseline date means January 6, 1975, for PM (TSP/PM_{10}) and SO_2 and February 8, 1988, for NO_2. *Minor* source baseline date means the earliest date after the trigger date on which the first complete application was submitted by a major stationary source or major modification subject to the requirements of 40 CFR 52.21 or Section 62-212.400, F.A.C. The trigger dates are August 7, 1977, for PM (TSP/PM_{10}) and SO_2 and February 8, 1988, for NO_2.

Table 3-6. PSD Allowable Increments

Pollutant	Averaging Time	Class ($\mu g/m^3$) I	II	III
$PM_{2.5}$	Annual arithmetic mean	1	4	8
	24-Hour maximum*	2	9	18
PM_{10}	Annual arithmetic mean	4	17	34
	24-Hour maximum*	8	30	60
SO_2	Annual arithmetic mean	2	20	40
	24-Hour maximum*	5	91	182
	3-Hour maximum*	25	512	700
NO_2	Annual arithmetic mean	2.5	25	50

*Maximum concentration not to be exceeded more than once per year at any one location.

Source: 40 CFR 50.

Sections 5.0 (PSD Class II areas) and 6.0 (PSD Class I areas) provide the ambient impact analyses for Jacksonville Lime.

3.2.5 ADDITIONAL IMPACT ANALYSES

Rule 62-212.400(8), F.A.C., requires additional impact analyses for three areas: associated growth, soils and vegetation impact, and visibility impairment. The level of analysis for each area should be commensurate with the scope of the project. A more extensive analysis would be conducted for projects having large emissions increases than those that will cause a small increase in emissions.

The growth analysis generally includes:

- A projection of the associated industrial, commercial, and residential growth that will occur in the area.
- An estimate of the air pollution emissions generated by the permanent associated growth.
- An air quality analysis based on the associated growth emissions estimates and the emissions expected to be generated directly by the new source or modification.

The soils and vegetation analysis is typically conducted by comparing projected ambient concentrations for the pollutants of concern with applicable susceptibility data from the air pollution literature. For most types of soils and vegetation, ambient air concentrations of criteria pollutants below the NAAQS will not result in harmful effects. Sensitive vegetation and emissions of toxic air pollutants could necessitate a more extensive assessment of potential adverse effects on soils and vegetation.

The visibility impairment analysis pertains particularly to Class I area impacts and other areas where good visibility is of special concern. A screening analysis showed that the proposed project would not have any significant effect on the visibility of the Class I areas within 300 km. Therefore, a quantitative estimate of visibility impairment is not warranted for Jacksonville Lime.

3.3 NEW SOURCE PERFORMANCE STANDARDS

Section 111 of the CAA, Standards of Performance of New Stationary Sources, requires EPA establish federal emissions standards for source categories that cause or contribute significantly to air pollution. These standards are intended to promote use of the best air pollution control technologies, taking into account the cost of such technology and any other non-air quality, health, and environmental impact and energy requirements. These standards apply to sources that have been constructed or modified since the proposal of the standard. Since December 23, 1971, EPA has promulgated more than 75 standards. 40 CFR 60 codifies the new source performance standards (NSPS) regulations. Those NSPS that are applicable or potentially applicable to Jacksonville Lime are discussed in the following subsections.

3.3.1 NSPS SUBPART OOO—NONMETALLIC MINERAL PROCESSING PLANTS

NSPS Subpart OOO is applicable to fixed or portable nonmetallic processing plants for which construction, modification, or reconstruction commenced on or after August 31, 1983. The rule was amended in April 2009, and the amendments will affect such facilities for which construction, modification, or reconstruction commenced on or after April 22, 2008. The proposed Jacksonville Lime facility with NAICS Code 3274 will be subject to this NSPS. For the purposes of this rule, the affected facilities include each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck, or railcar loading station. Nonmetallic mineral includes the following minerals or any mixture of them:

- Crushed and broken stone, including limestone, dolomite, granite, traprock, sandstone, quartz, quartzite, marl, marble, slate, shale, oil shale, and shell.
- Sand and gravel.
- Clay, including kaolin, fireclay, bentonite, Fuller's earth, ball clay, and common clay.
- Rock salt.
- Gypsum (natural or synthetic).

- Sodium compounds, including sodium carbonate, sodium chloride, and sodium sulfate.
- Pumice.
- Gilsonite.
- Talc and pyrophyllite.
- Boron, including borax, kernite, and colemanite.
- Barite.
- Fluorospar.
- Feldspar.
- Diatomite.
- Perlite.
- Vermiculite.
- Mica.
- Kyanite, including andalusite, silimanite, topaz, and dumortierite.

Jacksonville Lime's limestone handling operations will be subject to this rule. NSPS Subpart OOO specifies emissions limitations, monitoring, testing, reporting, and recordkeeping requirements for PM and opacity. Applicable NSPS Subpart OOO requirements for Jacksonville Lime are summarized as follows:

- For the affected facilities with capture systems, PM emissions (except for enclosed storage bins) will be limited to 0.032 gram per dry standard cubic meter (g/dscm) or 0.014 grain per dry standard cubic foot (gr/dscf), which is a reduction from the previous standard of 0.05 g/dscm or 0.022 gr/dscf. An initial stack test must also be performed. Since the specified EPA test methods are Method 5 or 17 (modified Method 5), the PM limits are assumed to apply to the filterable portion only.
- Fugitive emissions are those that are not controlled by a capture system. Opacity is a measure of visible emissions (VE). These sources as well as enclosed storage bins that are controlled by a capture system are subject to an opacity standard of 7 percent (6-minute average), which is also a reduction from the previous standard of 10 percent. Opacity from the fugitive emis-

sions sources must be measured using EPA Method 9 for at least 30 minutes (1 hour for enclosed storage bins and truck or railcar loading stations, unless they operate less than 1 hour at a time). The VE test must be repeated every 5 years.

- If wet suppression (water spray) is used, monitoring and recording the water flow to the wet suppression system (initially and monthly) can be used to demonstrate compliance with the opacity standard, instead of repeating the VE test every 5 years.
- If a baghouse is used to control emissions, the VE inspections must be conducted quarterly using EPA Method 22 while operating. If any VE are observed, a corrective action must be initiated within 24 hours. Alternatively, a bag house leak detection system may be used with a site-specific monitoring plan.
- Affected facilities that are enclosed in a building must also be tested for VE using EPA Method 9.

The owner/operator must notify the regulatory agency of the Method 9 testing at least 7 days in advance. (Note that FDEP requires 15-day advance notice). Subpart A requirement of notification of the date of construction commenced is waived for the affected facilities. Table 3-7 lists the sources that will be subject to NSPS Subpart OOO.

3.3.2 NSPS SUBPART JJJJ—STATIONARY SPARK IGNITION INTERNAL COMBUSTION ENGINES

No equipment is proposed to be installed that will be subject to NSPS Subpart JJJJ.

3.3.3 NSPS SUBPART HH—LIME MANUFACTURING PLANTS

NSPS Subpart HH applies to each rotary lime kiln for which construction or modification commenced after May 3, 1977. The proposed Jacksonville Lime facility will not use a rotary lime kiln and therefore will not be subject to this NSPS.

Table 3-7. Sources Subject to NSPS Subpart OOO

Source ID	Emissions Source Description	Pollution Control Device
BC-110	Belt Conveyor 110	Wet suppression
BC-125	Belt Conveyor 125	Wet suppression
BC-120	Belt Conveyor 120	Wet suppression
BC-200	Belt Conveyor 200	Wet suppression
BC-205	Belt Conveyor 205	Wet suppression
SN-210	Screen 210	Enclosed
LB-232	Charging Bin 232	Partial enclosure/BM-25
LB-233	Charging Bin 233	Partial enclosure/BM-24
BC-225	Belt Conveyor 225	BM-24
BC-230	Belt Conveyor 230	BM-25
SK-240	Skip Hoist 240	BM-24
SK-250	Skip Hoist 250	BM-25
SB-241	Surge Bin 241	Enclosed
SB-251	Surge Bin 251	Enclosed
SB-244	Surge Bin 244	Enclosed
SB-245	Surge Bin 245	Enclosed
SB-254	Surge Bin 254	Enclosed
SB-255	Surge Bin 255	Enclosed
BN-901	Reject Bin 901	BM-23
SP-901C	Truck Loadout	BM-23

Source: ECT, 2013.

3.3.4 NSPS SUBPART UUU—CALCINERS AND DRYERS IN MINERAL INDUSTRIES

NSPS Subpart UUU applies to each calciner and dryer at a mineral processing plant for which construction, modification, or reconstruction commenced after April 23, 1986. Calciner is defined as the equipment used to remove combined (chemical-bound) water and/or gases from mineral material through direct or indirect heating. Dryer means the equipment used to remove uncombined (free) water from mineral through direct or indirect heating. The proposed Jacksonville Lime's kilns will be considered calciners. However, the definition of a mineral processing plant is a facility that processes or produces one or more of the following list of minerals: alumina, ball clay, bentonite, diatomite, feldspar, fire clay, Fuller's earth, gypsum, industrial sand, kaolin, lightweight aggregate, magnesium compounds, perlite, roofing granules, talc, titanium dioxide, and vermiculite. Since limestone or lime is not listed, the proposed Jacksonville Lime facility will not be subject to this NSPS.

3.3.5 NSPS SUBPART Y—COAL PROCESSING AND PREPARATION PLANTS

NSPS Subpart Y regulates facilities in coal preparation and processing plants that process more than 200 tpd. Some provisions apply to those facilities for which construction, modification, or reconstruction commenced after October 27, 1974, and other provisions apply to those for which construction, modification, or reconstruction commenced after April 28, 2008. The proposed Jacksonville Lime facility will be processing primarily petcoke, but also coal and lignite. However, the maximum process rate for any one of the facilities will be less than 200 tpd, and therefore will not be subject to this NSPS.

3.4 NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS

The provisions of the CAA that address the control of HAP emissions, or air toxics, are found in Section 112. This section of the CAA includes provisions for the promulgation of National Emissions Standards for Hazardous Air Pollutants (NESHAPs), or technology-based maximum achievable control technology (MACT) standards, as well as several related programs to enhance and support the NESHAPs program. The NESHAP regulations are codified in 40 CFR 63.

Section 112 also requires EPA to publish and regularly update (at least every 8 years) a list of all categories and subcategories of major and area sources that emit HAPs. Major sources are those that have PTE to emit greater than 10 tpy of any individual HAP (out of 187 listed HAPs) or 25 tpy of total HAPs. Area sources consist of smaller-sized facilities that release lesser quantities of HAPs into the air, but are of concern collectively – particularly where large numbers of sources are located in heavily populated areas. The Section 112(c) list of source categories was initially published in the Federal Register (FR) on July 16, 1992, and has been periodically revised thereafter.

EPA must promulgate regulations establishing NESHAPs for each category or subcategory of major sources and area sources of HAPs that are listed pursuant to Section 112(c). The standards must require the maximum degree of emissions reduction that EPA determines to be achievable by each particular source category. Different criteria for MACT apply for new and existing sources. Less stringent standards, known as generally available control technology (GACT) standards, are allowed at the EPA Administrator's discretion for area sources.

Florida relies on the requirements of the CAA with respect to the regulation of HAPs or air toxics. Jacksonville Lime is a major source of HAPs (for hydrogen chloride) and will be subject to the following NESHAPs.

3.4.1 NESHAP SUBPART AAAAA—LIME MANUFACTURING PLANTS

NESHAPs Subpart AAAAA applies to each lime kiln, their associated coolers, and processed stone handling operations located at lime manufacturing plants, which are major sources of HAPs. The proposed vertical lime kilns and material handling operations are subject to the requirements of NESHAPs Subpart AAAAA. The applicable requirements are outlined in the following subsections.

3.4.1.1 Lime Kilns

The proposed vertical lime kilns satisfy the definition of "new lime kiln" as defined in 40 CFR 63.7082(b). As referenced in 40 CFR 63.7090(a), the vertical lime kilns are subject to the applicable emissions limits listed in Table 1 of the subpart. Table 1 states that new lime kilns and their associated coolers must limit PM emissions to 0.10 pound per ton of stone feed.

The kilns are also subject to the operating limits in Table 2, which states that the source must maintain and operate fabric filters such that:

- The bag leak detector system or PM detector alarm condition does not exist for more than 5 percent of total operating time in a 6-month period.
- The 6-minute average opacity for any 6-minute block period does not exceed 15 percent.

Per 40 CFR 63.711, the vertical lime kilns are subject to the initial testing requirements in Table 3 of Subpart AAAAA. Table 3 states that compliance with the emissions limits in Table 1 must be demonstrated by use of an EPA Method 5 test no later than 180 days from startup. All monitoring equipment and control devices, including bag leak detector system/continuous opacity monitoring system, must be installed and operating at the time of the initial compliance demonstration in accordance with the requirements in 40 CFR 63.7113. Periodic testing, as required by 40 CFR 63.7111, must be completed within 5 years of the initial performance test and within 5 years of each subsequent test thereafter.

Although a HAP is most important for making a lime manufacturing plant a major source, this rule is also intended to control nonvolatile and semivolatile metallic HAPs. As such, the lime manufacturing MACT specifies PM emissions limits (a surrogate for a variety of HAP metals), opacity limits, as well as monitoring requirements and operating limits. Emissions limits for material processing operations are the same as those under NSPS Subpart OOO, which was described previously in Section 3.3.1.

3.4.1.2 Processed Stone Handling Operations

Processed stone handling operations requirements are 0.05 g/dscm (0.022 gr/dscf) for PM, 10-percent opacity for fugitive emissions from enclosed sources, and 7-percent opacity from enclosed storage bins (see also NSPS Subpart OOO standards). Monthly VE tests must be conducted until 6 consecutive months of testing find no VE. Processed stone handling is defined in 40 CFR 63.7143 as equipment or transfer points between equipment used to transport processed stone (limestone processed to a size suitable for feeding to a lime kiln) and includes storage bins, conveying system transfer points, bulk loading or unloading systems, screening operations, bucket elevators, and belt conveyors, ending where the processed material is fed to the kiln.

Table 3-8 lists the processed stone handling operations affected facilities. These facilities must also prepare an operations, maintenance, and monitoring plan, which must be submitted to the permitting agency for approval.

As a new source, Jacksonville Lime must comply with this subpart upon startup. As required in the 40 CFR 63 General Provisions, one time initial notification and notification of compliance status, as well as semiannual compliance report and startup, shutdown, and malfunction report, must also be submitted (see Table 3-9).

3.4.2 NESHAPs SUBPART ZZZZ—STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES

There is no equipment proposed to be installed that will be subject to NESHAPs Subpart ZZZZ.

3.5 ACID RAIN PROGRAM

The acid rain program (ARP) was instituted in 1990 under Title IV of the CAA and in Chapter 62-214, F.A.C. The overall goal of the ARP is to achieve significant environmental and public health benefits through reductions in emissions of SO_2 and NO_x, the primary causes of acid rain. To achieve this goal at the lowest cost to society, the program employs both traditional and innovative, market-based approaches for controlling air pollution. In addition, the program encourages energy efficiency and pollution prevention. Phase I of the ARP began in 1995 and Phase II in 2000. The ARP only regulates electric generating units that burn fossil fuels such as coal, oil, and natural gas and that serve a generator greater than 25 megawatts. Therefore, the proposed Jacksonville Lime project is not subject to the ARP requirements.

Table 3-8. Processed Stone Handling Operations Affected Facilities

Source ID	Emissions Source Description	Pollution Control Device
LB-232	120-ton charging bin	Partial enclosure
LB-233	120-ton charging bin	Partial enclosure
BC-225	Belt Conveyor 225	DC-901/ BM-24
BC-230	Belt Conveyor 230	DC-902/BM-25
SK-240	Skip Hoist 240	DC-901/BM-24/partial enclosure
SK-250	Skip Hoist 250	DC-902/BM-25/ partial enclosure
SB-241	Surge Bin 241	Enclosure
SB-251	Surge Bin 251	Enclosure
SB-244	20-ton surge bin	Enclosure
SB-245	20-ton surge bin	Enclosure
SB-254	20-ton surge bin	Enclosure
SB-255	20-ton surge bin	Enclosure

Source: ECT, 2013.

Table 3-9. 40 CFR 63 General Provisions Reporting Requirements

Notification/Report	Description	Due Date	40 CFR 63
Initial notification	Notification to the director of initial startup of an affected source under NESHAPs Subpart AAAAA	120 days after affected source initial startup	.7130(c)
Notification of intent to conduct a performance test	Notification to the director of anticipated date of a performance test	60 days before performance test	.7130(d)
Notification of compliance status	Notification to the director of completion of each initial compliance demonstration that does not include a performance test	30 days after initial compliance demonstration	.7130(e)(1)
	Notification to the director of completion of each initial compliance demonstration that includes a performance test, including the performance test results	60 days after the initial observation	.7130(e)(2)
Compliance report	Report of any deviations from any emissions limitations during the reporting period or a statement that there were no deviations during the reporting period	Semiannually (postmarked January 31 or July 31 for the previous 6-month period)	.7131(b)
Startup, shutdown, and malfunction report	Report of actions taken in the event of a startup, shutdown or malfunction not consistent with the startup, shutdown, and malfunction plan	Fax or telephone within 2 working days after event and letter within 7 working days after event	.7131(b)

Source: ECT, 2013.

In 1998, EPA asked several eastern states to submit an SIP to reduce NO_x emissions further. This resulted in these states developing another program, called the NO_x budget trading program (NBP), from 2003 to 2008. This program regulates electric generating units as well as other large combustion sources. Florida was not subject to the NO_x SIP submittal requirement.

3.6 CLEAN AIR INTERSTATE RULE

Building on ARP and NBP, EPA developed the Clean Air Interstate Rule (CAIR) program in 2005, designed to reduce the amount of fine PM (i.e., $PM_{2.5}$) and ozone that crosses state lines. CAIR requires reductions in NO_x and SO_2 emissions (which contribute to formation of $PM_{2.5}$) from electric generating facilities in 28 eastern states and the District of Columbia beginning in 2009 using the same cap-and-trade approach used for ARP. Each state was required to revise its SIP to incorporate CAIR.

On July 11, 2008, the U.S. Court of Appeals for the DC Circuit (Court of Appeals) vacated CAIR. Following petitions filed by parties in the litigation the Court of Appeals issued a subsequent opinion on December 23, 2008, wherein it remanded the CAIR to EPA without vacatur. On July 6, 2010, EPA proposed a rule known as the Transport Rule to comply with the December 23, 2008, Court of Appeals remand. On July 6, 2011, EPA finalized the rule, which became known as the Cross-State Air Pollution Rule (CSAPR). On August 12, 2012, the Court of Appeals decided that EPA violated the CAA in CSAPR by not calculating the required emissions reductions "on a proportional basis that took into account contributions of other upwind states to the downwind states' nonattainment problems." Therefore, CAIR is still in effect while EPA develops yet another replacement rule.

Florida adopted EPA's 40 CFR 96 CAIR NO_x and SO_2 trading programs for SIPs by reference in Section 62-204.800, F.A.C. Florida's implementation of the CAIR is set forth at Section 62-296.470, F.A.C. Since the federal CAIR only targets the fossil fuel-fired electric generating units, and Florida has not exercised its option to regulate other sources, the proposed Jacksonville Lime facility will not be affected by this rule at this time.

3.7 COMPLIANCE ASSURANCE MONITORING

Compliance assurance monitoring (CAM) regulations of 40 CFR 64 are applicable, on a pollutant-specific basis, if the emissions unit meets the following criteria:

- Major source (based on precontrolled potential emissions).
- Subject to a federally enforceable applicable requirement(s).
- Has a control device, as defined by the CAM rule (40 CFR 64).
- Certain exemptions available for those emissions units subject to an NSPS or NESHAPs (after November 15, 1990), stratospheric ozone protection requirements, ARP requirements, requirement of an approved emissions trading program, Title V emissions cap, and those required to have continuous compliance demonstration that does not use an assumed control factor.

At the proposed Jacksonville Lime facility, the only pollutant with an active air pollution control device is PM. Precontrol PM emissions (i.e., without the baghouse) will be greater than the major source threshold of 100 tpy for each of the kilns. However, the kilns will be subject to an NSPS, a NESHAP, as well as a BACT emissions limit. A continuous parameter monitoring system, such as opacity monitors, to demonstrate continuous compliance with the opacity and/or PM emissions limits is expected to satisfy the CAM requirements.

3.8 RISK MANAGEMENT PLAN

To prevent accidental releases of substances that can cause serious harm to the public and the environment and minimize potential impacts of such releases if they do occur, EPA established a rule under Section 112(r) of the 1990 CAAA. This rule, known as the Chemical Accident Prevention Rule, is codified in 40 CFR 68. If a facility handles, manufactures, uses, or stores any of the toxic and/or flammable substances (regulated substances) listed in 40 CFR 68.130 in a quantity above the specified threshold in a covered process, it is required to develop and implement a risk management program and submit a risk management plan for that process.

Jacksonville Lime will not be storing or processing any of the listed chemicals above their respective thresholds and therefore will not trigger the risk management plan requirements.

3.9 STATE REGULATORY REQUIREMENTS

General provisions of air pollution control and general requirements for stationary sources are contained in Chapters 62-204 and 210, F.A.C., respectively. Emissions standards for stationary sources are contained in Chapter 62-296, F.A.C. General pollutant emissions limit standards are included in Section 62-296.320, F.A.C. Sections 62-296.401 through .418, F.A.C., specify emissions standards for 18 categories of sources. Section 62-296.470 addresses CAIR requirements. Sections 62-296.500 through .570, F.A.C., establish reasonably available control technology (RACT) requirements for VOC- and NO_x-emitting facilities. RACT requirements for lead and PM are found in Sections 62-296.600 through .605 and .700 through .712, F.A.C., respectively. Section 62-204.800, F.A.C., adopts federal regulations, including NSPSs, by reference.

With respect to Jacksonville Lime, the general VE Rule 62-296.320(4)(b), F.A.C., of a 20-percent opacity limit will apply to all point sources. This standard is less stringent than the NSPS or NESHAP opacity limit of 7-percent opacity. Reasonable precautions to prevent unconfined PM emissions (e.g., fugitive emissions of material handling and storage activities) will be required pursuant to Rule 62-296.320(4)(c), F.A.C.

Section 62-296.700, F.A.C., RACT standards for PM, is potentially applicable to Jacksonville Lime, specifically Section 62-296.711, F.A.C., for Materials Handling, Sizing, Screening, Crushing and Grinding Operations, and Section 62-296.712, F.A.C., for Miscellaneous Manufacturing Process Operations. Although Jacksonville Lime is located in a PM air quality maintenance area, all of its proposed PM emissions units (except for those that are exempt from permitting) will receive a BACT determination per PSD requirements. Therefore, the PM RACT standards will not apply to Jacksonville Lime's PM sources, i.e., the proposed kilns and associated material handling operations.

The 3.5-MMBtu/hr natural gas-fired fuel heater can be exempt from permitting pursuant to Rule 62-210.300(3)33, F.A.C., provided that this unit remains less than 10 MMBtu/hr and burns only natural gas. This source is listed as an unregulated emissions unit in the attached FDEP application form.

3.10 OTHER REGULATORY REQUIREMENTS

The Jacksonville Environmental Protection Board established a rule (Rule 2) to address air pollution control measures locally, pursuant to Sections 362.104(c) and 73.102, Ordinance Code of the City of Jacksonville. The rule is enforced by the Environmental Quality Division of the Environmental and Compliance Department.

Rule 2 incorporates FDEP Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-252, 62-296, and 62-297, F.A.C., by reference. Additionally, Rule 2 includes the following:

- Part VI—Gasoline Vapor Control in Duval County.
- Part VII—Open Burning and Frost Protection Fires.
- Part VIII—AAQS for Aggregate Reduced Sulfur Primarily from Kraft Paper Mills.
- Part IX—Air Pollution Episodes.
- Part XII—General Standard for VOCs, Emissions from Ships and Locomotives, and Air Pollution Nuisances.

The only part of Rule 2 that could potentially affect the proposed Jacksonville Lime facility is Rule 2.1303 (Air Pollution Nuisances). Air pollution nuisance is defined as "the presence in the atmosphere, from any source or sources whatever, of any contaminant, including but not limited to smoke, ashes, dust, dirt, grime, soot, acids, fumes, gases, vapors, abrasive blasting grit, paint or any other substance or combination of substances, in such amounts as to adversely affect human welfare, or cause harm or damage to property, or unreasonably interfere with the enjoyment of life or property or the conduct of business."

4.0 BEST AVAILABLE CONTROL TECHNOLOGY

4.1 METHODOLOGY

BACT analyses were conducted using the following five step *top-down* approach, which was briefly described previously in Section 3.2.2:

- Step 1—Identify available control technologies for each PSD pollutant subject to review.
- Step 2—Eliminate technically infeasible control technologies.
- Step 3—Rank the remaining control technologies by control effectiveness.
- Step 4—Evaluate feasible control technologies, beginning with the most efficient, with respect to economic, energy, and environmental impacts.
- Step 5—Select as BACT the most effective control technology that is not rejected based on adverse economic, environmental, and/or energy impacts.

The following sections describe these steps in greater details, as they pertain to the proposed Jacksonville Lime project.

4.1.1 IDENTIFY AVAILABLE CONTROL TECHNOLOGIES

The first step in the top-down BACT procedure is the identification of all available control technologies, based on knowledge of the particular industry of the applicant, control technology vendors, technical journals and reports, and previous control technology permitting decisions for other identical or similar sources. Alternatives considered included process designs and operating practices that reduce the formation of emissions, postprocess stack controls that reduce emissions after they are formed, and combinations of these two control categories. Sources of information used to identify control alternatives included:

- EPA RACT/BACT/lowest achievable emissions rate (LAER) Clearinghouse (RBLC) via the RBLC information system database.
- Recent permits for lime kiln projects.
- FDEP BACT determinations for similar facilities.
- Experience with similar projects.

- Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Cement and Lime Manufacturing Industries (December 2001).
- International Finance Corporation (IFC) Environmental, Health, and Safety Guidelines for Cement and Lime Manufacturing (April 30, 2007).

Jacksonville Lime and ECT performed searches of the RBLC database as well as other documents described previously to identify the emissions control technologies and emissions levels for emissions sources comparable to the proposed facility, as determined by various permitting authorities as BACT within the past 10 years.

The RBLC database is available to the public through the EPA's Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network, which contains technologies and corresponding emissions limits that have been approved by regulatory agencies in previous permit actions. These technologies are grouped into categories by industry and can be referenced in determining what emissions levels were proposed for similar types of emissions units. The following categories were searched:

- Lime/limestone handling/kilns/storage/manufacturing (RBLC Code 90.019).
- Nonmetallic mineral processing (RBLC Code 90.024).
- Other mineral processing sources (RBLC Code 90.999).
- Fugitive dust sources (RBLC Code 99.100).
- Other miscellaneous sources (RBLC Code 99.999).

Although there are related industries (e.g., cement and clay sintering operations) available on the RBLC database, the substantial difference in design and function of vertical lime kilns make direct comparison to units in those industries of limited value. Furthermore, many of the kilns in the lime category are rotary kilns, which make direct comparison challenging, despite being in the same category. Appendix E presents summary tables of relevant BACT determinations for the units mentioned previously, as well as other relevant literature from IPPC and IFC for facilities outside the United States.

4.1.2 ELIMINATE TECHNICALLY INFEASIBLE OPTIONS

After the available control technologies have been identified, each technology is evaluated for technical feasibility in controlling the PSD pollutant emissions from the source in question. An undemonstrated technology is only technically feasible if it is available and applicable. A control technology is only considered available if it can be obtained commercially (i.e., the technology has reached the licensing and commercial sales phase of development). Control technologies in the research and development and pilot-scale phases are not considered available. Based on EPA guidance, an available control technology is presumed applicable if it can be reasonably installed and operated on the source type under consideration or has been permitted or actually implemented by a similar source. Decisions about technical feasibility of a control option consider engineering principals, as well as physical or chemical properties of the emissions stream in comparison to emissions streams from similar sources successfully implementing the control alternative.

4.1.3 RANK REMAINING CONTROL OPTIONS

Remaining technically feasible control options not eliminated in the previous step are rank ordered based on their overall control effectiveness (from high to low) for the PSD pollutant under review, establishing a control technology hierarchy.

4.1.4 EVALUATE MOST EFFECTIVE CONTROL OPTION

The control technology hierarchy is evaluated starting with the *top*, or most stringent alternative, to determine economic, environmental, and energy impacts and assess the feasibility or appropriateness of each alternative as BACT based on site-specific factors. If the top-ranked control technology with the highest removal efficiency is accepted as BACT, an assessment of collateral environmental impacts (i.e., potential impacts of unregulated air pollutants or potential impacts in other media) is conducted to determine whether such impacts would deem the control technology unacceptable. If there are no issues regarding collateral environmental impacts, the BACT analysis is complete, and the top-ranked control technology is proposed as BACT. Evaluation of energy and economic impacts is not required for that technology, since the only reason for conducting these assessments is to document the rationale for rejecting that technology as BACT. If that top-ranked control technology is rejected as BACT, the next most stringent option is evaluated, and an assessment of energy, environmental, and economic impacts is then performed. Economic analyses employ procedures found in the OAQPS Air Pollution Control Cost Manual, Sixth Edition (EPA, 2002).

4.1.5 SELECT BACT

This evaluation process continues until an applicable control alternative is determined to be both technologically and economically feasible, thereby defining BACT for the evaluated pollutant. Although the first four steps of the top-down BACT process involve technical and economic evaluations of potential control options (i.e., defining the appropriate technology), the selection of BACT in the fifth and final step involves an evaluation of emissions rates achievable with the selected control technology. In other words, BACT should be translated into a numerical emissions limit unless technological or economic limitations of the measurement methodology would make the imposition of a numerical emissions limit impractical or infeasible, in which case a work practice or operating standard can be imposed.

As defined by Rule 62-210.200(40), F.A.C., BACT emissions limitations must be no less stringent than any applicable NSPS (40 CFR 60), NESHAP (40 CFR 63), and FDEP emissions standards (Chapter 62-296, Stationary Sources—Emissions Standards, F.A.C.). The NSPS, NESHAPs, and FDEP emissions standards applicable to Jacksonville Lime were previously discussed in Section 3.0.

4.1.6 REDEFINING THE SOURCE

Historical practice and recent court rulings have made it clear that a key foundation of the BACT process is that it should apply to the type of source proposed by the applicant and that redefining the source is not appropriate in a BACT determination. Though BACT is based on the type of source proposed by the applicant, the scope of the applicant's ability to define the source is not absolute. As EPA notes, a key task for the reviewing agency is to determine which parts of the proposed process are inherent to the applicant's purpose and which parts may be changed without changing that purpose. On August 24, 2006, EPA provided the following opinion on the Prairie State Generating Company project:

> "We find it significant that all parties here, including Petitioners, agree that Congress intended the permit applicant to have the prerogative to define certain aspects of the proposed facility that may not be redesigned through application of BACT and that other aspects must remain open to redesign through application of BACT."
>
> "When the Administrator first developed [EPA's policy against redefining the source] in Pennsauken, the Administrator concluded that permit conditions defining the emissions control systems 'are imposed on the source as the applicant has defined it' and that 'the source itself is not a condition of the permit.' "

Given that some parts of the project are not open for review under BACT, EPA then discusses that it is the permit reviewer's burden to define the boundary. Based on precedent set in multiple prior EPA rulings (e.g., Pennsauken County Resource Recovery [1988], Old Dominion Electric Cooperative [1992], Spokane Regional Waste to Energy [1989]), EPA states the following in the Prairie State Generating Company case:

> "For these reasons, we conclude that the permit issuer appropriately looks to how the applicant, in proposing the facility, defines the goals, objectives, purpose, or basic design for the proposed facility. Thus, the permit issuer must be mindful that BACT, in most cases, should not be applied to regulate the applicant's objective or purpose for the proposed facility, and therefore, the permit issuer must discern which design elements are inherent to that purpose, articulated for reasons independent of air quality permitting, and which design elements may be changed to achieve pollutant emissions reductions without disrupting the applicant's basic business purpose for the proposed facility."

EPA's opinion in Prairie State was upheld on appeal to the Seventh Circuit Court of Appeals, where the court affirmed the substantial deference due the permitting authority on defining the demarcation point.

Taken as a whole, the permitting agency is tasked with determining which controls are appropriate, but the discretion of the agency does not extend to a point requiring the applicant to redefine the source.

Jacksonville Lime defines the proposed project as two identical multiple-fuel vertical lime kilns designed to produce lime (CaO) from limestone ($CaCO_3$), associated material handling operations for raw material and fuel preparation, and final product handling.

The vertical kilns are designed to produce a product (lime) that meets customer quality specifications at a competitive market price in amounts suitable for the market demand. To allow the operation of the kilns to be economically viable, Jacksonville Lime has designed the kilns to fire multiple fuels to accommodate swings in commodity fuel prices as well as to produce products for a wide range of markets. For instance, if the price of one fuel becomes prohibitive, Jacksonville Lime will be able to switch to a more economically viable fuel instead of producing a product that is too expensive for the market or idling operations. The vertical kilns were selected and designed specifically to meet the basic purpose of the plant and modifications to the equipment solely for the purposes of reducing regulated air pollutant emissions is not appropriate in a BACT analysis.

4.1.7 ECONOMIC ANALYSES

Economic analyses were performed to compare total annualized costs (capital and operating) for potential control technologies. Capital costs include the initial cost of the components intrinsic to the complete control system. Annual operating costs include the financial requirements to operate the control system on an annual basis and include overhead, maintenance, outages, raw materials, and utilities.

The capital cost estimating technique used is based on a factored method of determining direct and indirect installation costs. That is, installation costs are expressed as a function of known equipment costs. This method is consistent with the latest EPA OAQPS guidance manual on estimating control technology costs.

Total purchased equipment cost represents the delivered cost of the control equipment, auxiliary equipment, and instrumentation. Auxiliary equipment consists of all the structural, mechanical, and electrical components required for the efficient operation of the device. Auxiliary equipment costs are estimated as a straight percentage of the equipment cost. Direct installation costs consist of the direct expenditures for materials and labor for site preparation, foundations, structural steel, erection, piping, electrical, painting, and facilities. Indirect installation costs include engineering and supervision of contractors, construction and field expenses, construction fees, and contingencies. Other indirect costs include equipment startup, performance testing, working capital, and interest during construction.

Annual costs are comprised of direct and indirect operating costs. Direct annual costs include labor, maintenance, replacement parts, raw materials, utilities, and waste disposal. Indirect operating costs include plant overhead, taxes, insurance, general administration, and capital charges. Replacement part costs, such as the cost of replacement bags for a baghouse, were included where applicable, while raw material costs were estimated based on the unit cost and annual consumption. With the exception of overhead, indirect operating costs were calculated as a percentage of the total capital costs. The indirect capital costs were based on the capital recovery factor (CRF), defined as:

$$CRF = \frac{i\,(1+i)^n}{(1+i)^n - 1}$$

where: i = annual interest rate.
n = equipment life in years.

The equipment life is based on the normal life of the control equipment and varies on an equipment type basis. The same interest applies to all control equipment cost calculations. For this analysis, an interest rate of 7 percent was used based on information provided in the most recent OAQPS Control Cost Manual. The control effectiveness (annual cost per ton of pollutant reduced) for a given technologically feasible control option is the annual costs divided by calculated emissions reduction.

Appendix F contains detailed cost analyses calculations for economic analyses presented within this BACT analysis.

4.2 BACT ANALYSIS FOR NO_x—LIME KILNS

4.2.1 NO_x FORMATION IN LIME KILNS

There are three types of chemical kinetic processes that form NO_x emissions from processes such as vertical lime kilns. The NO_x emissions from these chemical mechanisms are referred to as thermal, fuel, and prompt NO_x. For all practical purposes, *prompt NO_x*, which results from the combustion of intermediate combustion products near the flame front, is not important in the lime manufacturing process. *Thermal NO_x* is generated by the oxidation of nitrogen (N_2) in the air as it passes through the flame in the kiln. This reaction requires high temperatures, hence the name thermal NO_x. Formation of nitrogen oxide (NO) from oxygen (O_2) and nitrogen in air at high temperatures is described by the well-known Zeldovich mechanism. *Fuel NO_x* is the result of the conversion of nitrogen contained in fuels to NO_x during fuel combustion. In a vertical lime kiln, due to the high temperatures involved, thermal NO_x is the predominant mechanism of NO_x formation from the lime manufacturing process. It should also be noted that NO_x emissions can vary significantly from one kiln to another. There are several factors that can contribute to variations in NO_x emissions particularly when comparing data collected on a short-term basis. These factors include the ability to control kiln feed consistently, the combustibility of the raw material, and individual operator inputs to ensure proper product quality. Each of these variables can result in the need to adjust the heat input to the pyroprocessing system which alters the specific heat consumption of the kiln and, in turn, contributes to variations in the rates of thermal NO_x generation on a plant and kiln specific basis. This makes the comparison of specific emissions limits, particularly those based on short-term stack tests, difficult at best.

4.2.2 AVAILABLE NO_x CONTROL TECHNOLOGIES

Candidate NO_x control options identified from the RBLC search and the literature review include the following:

- Selective catalytic reduction (SCR).
- Selective noncatalytic reduction (SNCR).
- Catalytic ceramic filter media.
- Nonselective noncatalytic reduction (NSNCR).
- Indirect firing low-NO_x burner.
- Mid-kiln firing.
- Oxidation/reduction scrubbing.
- Water/steam injection.
- Mixing air fan/air staging.
- Clean fuels.
- Vertical parallel flow regenerative kiln.
- Good combustion techniques.

A description of each of the listed control technologies, along with their respective control effectiveness and technical feasibility, is provided in the following subsections.

4.2.2.1 Selective Catalytic Reduction

SCR reduces NO_x emissions by reacting ammonia (NH_3) with exhaust gas NO_x to yield nitrogen and water vapor (H_2O) in the presence of a catalyst. Ammonia is injected upstream of the catalyst bed where the following primary reactions take place:

$$4\ NH_3 + 4\ NO + O_2 \rightarrow 4\ N_2 + 6\ H_2O$$

$$4\ NH_3 + 2\ NO_2 + O_2 \rightarrow 3\ N_2 + 6\ H_2O$$

The catalyst serves to lower the activation energy of these reactions, which allows the NO_x conversions to take place at a lower temperature (i.e., in the range of 500 to 800°F). Typical SCR catalysts include metal oxides (titanium oxide and vanadium), noble metals (combinations of platinum and rhodium), zeolite (alumino-silicates), and ceramics. SCR can potentially achieve 70- to 90-percent reduction of NO_x.

There are three types of SCR that could potentially be used to control NO_x emissions: end-of-the-pipe, high-dust, and semi-dust. In an end-of-the-pipe system, SCR is placed after the PM control device to prevent fouling of the catalyst bed. To achieve a temperature within the desired operating range (480 to 800°F) of a tail pipe SCR after the baghouse, a heat exchanger system would need to be installed in the kiln. In a high-dust system, SCR is placed prior to the PM control device, where the temperature is closer to the optimum operating temperature of SCR and heat exchangers are not needed. However, due to the high particulate content of the gas stream at this location, a higher volume of catalyst and more frequent cleaning of the catalyst would be necessary for reliable operation. Finally, in the semi-dust system, SCR is placed downstream of an electrostatic precipitator (ESP) or a cyclone. This is a highly experimental technology and would require the kiln to be equipped with an ESP, which would not be consistent with the PM BACT determination for this kiln (discussed in Section 4.5.3).

In general, the main concern regarding the widespread application of this technology, as stated by EPA, is the potential for dust buildup on the catalyst, which can be influenced by site-specific raw material characteristics, such as trace contaminants, that may produce a stickier particulate than is experienced at sites where the technology has been installed. This buildup has the potential to reduce the effectiveness of the SCR technology and make cleaning of the catalyst difficult, resulting in kiln downtime and significant operational costs. SCR also requires an optimum temperature range of 480 to 800°F and fairly constant temperatures, or emissions of NO_x and ammonia can increase.

For these reasons, SCR was determined to be a technically infeasible option for controlling NO_x emissions from the proposed kilns. Despite these technological challenges and concerns, for conservatism, Jacksonville Lime conducted an economic analysis for the tail pipe SCR configuration.

4.2.2.2 Selective Noncatalytic Reduction

The SNCR process involves the gas phase reaction, in the absence of a catalyst, of NO_x in the exhaust gas stream with injected ammonia or urea to yield nitrogen and water and CO_2 if urea is used. Either ammonia or urea is injected into a hot exhaust gas stream at a location specifically chosen to achieve the optimum reaction temperature and residence time. Simplified chemical reactions for these processes are as follows:

$$4\ NO + 4\ NH_3 + O_2 \rightarrow 4\ N_2 + 6\ H_2O$$

$$4\ NH_3 + 5\ O_2 \rightarrow 4\ NO + 6\ H_2O$$

$$CO(NH_2)_2 + 2\ NO + \tfrac{1}{2}\ O_2 \rightarrow 2\ N_2 + CO_2 + 2\ H_2O$$

The critical design parameter for both SNCR processes is the reaction temperature. At temperatures below 1,600°F, rates for both reactions decrease, allowing unreacted ammonia to exit with the exhaust stream. Temperatures between 1,600 and 2,000°F will favor the first reaction, resulting in a reduction in NO_x emissions. The second reaction will dominate at temperatures above approximately 2,000°F, causing an increase in NO_x emissions. Due to reaction temperature considerations, the SNCR injection system must be located at a point in the exhaust duct where temperatures are consistently between 1,600 and 2,000°F.

SNCR is usually installed after the particulate control and requires good mixing of gases and reducing agent, optimal temperature range, and sufficient residence time. It usually achieves NO_x reduction of 30 to 50 percent. In August 2011, Unimin in Calera, Alabama, demonstrated the application of SNCR to a rotary kiln.

End-of-pipe SNCR would require significant reheating of the exhaust stream to achieve the minimum temperatures required for the reduction of NO_x to nitrogen. The only possibility for satisfying the temperature requirement for the chemical reaction without reheating is to apply the technology in the combustion zone (i.e., similar to mid-kiln SNCR in rotary kilns). Mid-kiln SNCR in rotary kilns requires temperatures between 1,600 and 2,100°F to avoid potential contamination of product by the reagent used in SNCR. The only possible location for SNCR in a vertical kiln is the crossover channel. The crossover channel is short in length and has fluctuating temperatures and flow direction, which render the technology technically infeasible for a vertical lime kiln. Jacksonville Lime is not aware of any successfully demonstrated SNCR applications in vertical kilns. For this reason, the only technically feasible option for SNCR control is end-of-pipe, which would require significant reheating, resulting in higher NO_x emissions from reheating the stream.

4.2.2.3 Catalytic Ceramic Filter Media

Catalytic ceramic candle filter technology is capable of controlling PM, SO_2, and NO_x emissions. NO_x control is achieved by ammonia or urea injection prior to filters. Typically, 10- to 20-millimeter (mm) wall ceramic fiber matrix with catalyst particles removes NO_x, while a 0.3-mm ceramic film captures the particles. The mechanism for NO_x removal is similar to that of an SCR. This is an innovative technology, but its use is only limited to glass furnaces and waste incinerators and has not been demonstrated on lime or cement kilns. Additionally, similar to SCR technology, there are technical concerns with respect to catalyst fouling.

4.2.2.4 Nonselective Noncatalytic Reduction

NSNCR (also referred to as staged combustion air) is comprised of an initial combustion zone (oxidizing), a secondary combustion zone (reducing), and a final combustion zone (oxidizing). In the initial combustion zone, there is a slight excess of air, and the highest temperatures are reached, causing generation of thermal NO_x. In the secondary combustion zone, a secondary burner injects additional fuel into the marginally lean air, creating strongly rich air (i.e., more fuel is present than oxygen available to oxidize the fuel). In this reducing atmosphere, NO is reduced to nitrogen as the hydrocarbons and CO scavenge oxygen. For proper operation, the secondary combustion zone must be between 1,800 and 2,200°F. Following this section is the final combustion zone, where secondary air (cooler) provides sufficient oxygen to oxidize the remaining combustibles. The lower temperatures in the final combustion zone reduce NO_x emissions.

Theoretically, NSNCR can result in NO_x reductions of 20 to 50 percent in rotary lime kilns. However, the technology is not listed as a control for NO_x in the RBLC database, and Jacksonville Lime is not aware of any lime kilns and only a few cement kilns using this technology. Process differences between cement and lime production are the reason this technology has not been applied to rotary kilns in the lime industry. A multistage preheater and cyclones, which even a rotary lime kiln does not have, are necessary for the staged combustion required for this control technology. The principles and operational design of a vertical shaft kiln are entirely different from that of a rotary kiln. There are no feasible locations for creation of secondary burning zones or for introduction of additional combustion air; therefore, this technology is technically infeasible for vertical lime kilns as well as for rotary lime kilns.

4.2.2.5 Indirect Firing Low-NO_x Burner and Mid-Kiln Firing

This low-NO_x burner technology uses a multichannel burner that creates primary and secondary combustion zones. The primary zone is fuel-rich and oxygen-deficient creating less NO_x. The secondary zone is oxygen-rich and operates at a lower temperature where combustion is completed. The design reduces the concentration of NO_x by improving mixing of the primary air-fuel stream. It has been successfully installed on more than 20 rotary and preheater type kilns in the United States.

Mid-kiln firing is another staged combustion method where a second fuel system is introduced at the midpoint of the kiln. Mid-kiln firing changes the flame temperature and length, which may reduce thermal NO_x formation by burning part of the fuel at a lower temperature and creating reducing conditions at the fuel injection point, which may destroy some of the NO_x formed upstream in the primary kiln burning zone.

A vertical kiln uses multiple fuel lances that are suspended in the moving limestone bed as opposed to a single burner used in rotary lime kilns and cement kilns. It, therefore, uses mid-kiln firing as an inherent part of its design; therefore, further evaluation of the mid-kiln firing technology will not be conducted. Furthermore, the burner design of the vertical kiln is inherent to the technology, which renders installing low-NO_x burners technically infeasible. The fuel lances supplied for Jacksonville Lime's vertical kilns will be designed to optimize fuel consumption and will function as low-NO_x burners under this kiln design and technology.

4.2.2.6 Oxidation/Reduction Scrubbing

Oxidation/reduction scrubbing using BOC Gases and Technology's LoTO$_x$™ system and Tri-Mer Corporation's Tri-NO$_x$® consist of injecting ozone, ionized oxygen, or hydrogen peroxide to selectively oxidize NO_x to higher soluble forms that can be removed by a wet scrubber.

This technology would require reheating of the exhaust stream from the scrubber to prevent condensation in the flue stack. The reheating would result in additional NO_x emissions from combustion to provide sufficient heat to prevent condensation. Additionally, this control technology is generally used in the cement industry for wet kilns and is not transferrable to a dry vertical lime kiln. Therefore, oxidation/reduction scrubbing is considered infeasible.

4.2.2.7 Water/Steam Injection

Under this option, water or steam would be injected into the main flame of the kiln, which reduces the flame temperature and generation of thermal NO_X.

As stated previously, a vertical kiln uses multiple fuel lances that are directly in contact with the moving limestone bed. This provides a nearly flameless combustion zone. Therefore, any NO_x reduction that may be achieved by rapid quenching of the flame temperature is an inherent part of the kiln design and operation. Therefore, the technology referred to as "water/steam injection" is not relevant to the kiln design and is not a technologically feasible control option for the proposed kilns.

4.2.2.8 Mixing Air Fan and Air Staging

Mixing air fans consist of high pressure air injected in a tertiary combustion zone to achieve effective mixing and staged combustion (reduces kiln gas stratification). This technology is only applicable to rotary kilns where heat transfer is less efficient than vertical kilns. There are no confirmed records of any NO_x reduction from this technology on vertical lime kilns. Air staging requires primary and secondary combustion zones similar to mid-kiln firing, which cannot be achieved on a vertical lime kiln. Therefore, both mixing air fan and air staging are considered technically infeasible for vertical lime kilns.

4.2.2.9 Use of Clean Fuels

The use of cleaner fuels (such as natural gas) in lieu of solid fuels could potentially lower NO_x emissions. However, since thermal NO_x formation is inherent to the operation of a lime kiln, the effectiveness of overall NO_x reduction is limited.

4.2.2.10 Vertical PFR Kiln Technology

A vertical PFR kiln increases the thermal efficiency of the kiln by having two shafts that alternate the burning and nonburning zones. Since the fuel required is approximately 40 to 50 percent less per ton of lime produced for a vertical PFR kiln than for a traditional rotary kiln, fuel NO_x formation is inherently lower. Flame is produced within the stone bed and completely surrounded by material of lower temperature. Due to the quick heat transfer, peak flame temperature is minimized and thermal NO_x formation is minimized.

4.2.2.11 Good Combustion Techniques

Good combustion techniques include oxygen control, process design, and optimized process control. Examples include homogenization of fuel and raw materials, heating rate, less excess air, flame position, length, and temperature. Computer-based automated controls and gravimetric solid fuel feed systems also optimize combustion parameters, allowing for less fuel use and thermal NO_x production.

4.2.3 PROPOSED BACT FOR NO_x—LIME KILNS

Of the NO_x BACT technologies discussed in the previous subsections, the remaining (i.e., technologically feasible) control technologies are SCR, SNCR, use of clean fuels, inherent PFR kiln design, and good combustion techniques. The next step in the top-down BACT assessment procedure is to evaluate the most effective of these remaining options and document the results. This has been performed on the basis of economic, energy, and environmental considerations, and is described in the following paragraphs.

For SCR, Jacksonville Lime calculated the cost for the reagent usage, natural gas to reheat the exhaust stream to the optimum operating temperature, and annualized capital costs for a conservatively low capital investment. If additional costs for electricity and catalyst costs are incorporated, the control cost for SCR will likely exceed $9,800 per ton of NO_x removed. The analysis also does not include the additional emissions associated with the heater required to reheat the exhaust gas after the fabric filter. Tables F-1 and F-2 of Appendix F of this application present supporting documentation for this calculation. Due to this high cost without accounting for all costs required to implement this technology, Jacksonville Lime determined that the use of SCR is not BACT based on technological, environmental, and economic analyses.

For SNCR, the cost of reheating the stream with natural gas alone to control NO_x with an SNCR system is estimated to be between $19,000 and $29,000 per ton of NO_x reduced, depending on the price of natural gas, as shown Table F-3 of in Appendix F. This cost estimate does not include capital costs, annual operating and maintenance costs, or reagent costs. Energy impacts associated with use of this technology would include combustion of natural gas to reheat the flue gas, also leading to subsequent environmental impacts from use of natural gas leading to additional NO_x emissions. Also, as mentioned previously, there is no reported effective use of such technologies on vertical kilns similar to those to be installed at the Jacksonville Lime facility. The use of an SNCR for control of NO_x emissions from vertical kilns would be considered experimental. Therefore, the cost estimates provided would likely increase due to the potential for additional research and technology modifications for implementation of this technology on the kilns at the Jacksonville Lime facility. As such, Jacksonville Lime has determined that use of SNCR is not BACT based on the environmental, energy, and economic analyses.

The use of cleaner fuels such as natural gas would result in a product that has less sulfur. The proposed vertical kilns are intended to serve markets that accept higher sulfur content (commodity based) lime, as well as lower sulfur content (food-grade based) lime. Limiting of the fuel to natural gas alone will limit the intended markets for the kilns, which fundamentally changes the scope of the project. Therefore, this option is technically infeasible for the proposed multiple fuel vertical kilns. However, Jacksonville Lime has conservatively provided a cost analysis for the use of clean fuels for this BACT determination in Table F-4 of Appendix F. Of a particular concern is the high volatility of natural gas prices compared to petcoke. In the foreseeable future, natural gas costs for industrial users are projected to vary from $2.00 to $7.00 per million British thermal units, while petcoke costs have remained below $5 per million British thermal units (between $2.00 and $3.00 per million British thermal units). Taking the variability into consideration, Jacksonville Lime conducted an economic analysis to compare the use of petcoke and natural gas and found that the incremental cost effectiveness for NO_x reduction is as low as $12,000 and may exceed $21,000 per ton of NO_x reduced, depending the price of natural gas relative to that of petcoke.

Table 4-1 summarizes the NO_x control options evaluated and their respective control efficiencies and cost effectiveness.

Based on the previous information, Jacksonville Lime has determined that employing good combustion techniques and PFR kiln design is the selected control technology for the proposed kilns. There are no negative environmental and energy impacts associated

Table 4-1. Comparison of Control Options for NO_x

Control Technology	Potential Control Efficiency (%)	Cost Effectiveness ($/ton)
SCR (end-of-the-pipe)	70 to 90	9,900
SNCR (end-of-the-pipe)	30 to 50	23,200
Use of clean fuels	Approximately 90 (natural gas versus petcoke)	15,800 to 21,000 (incremental, depending on natural gas price)
Kiln design and good combustion practices (using petcoke)	Base case	Not applicable

Source: ECT, 2013.

with these options. In addition, the RBLC search proves that good combustion techniques are widely accepted as BACT for lime kilns. Although there are no vertical lime kilns listed in the RBLC database as being permitted since January 1, 2000, a chemical lime facility in Clifton, Virginia, was issued a PSD permit in October 2006 with a NO_x emissions limit of 3.0 pound (lb) per ton lime. There are several rotary and preheater kilns listed in the RBLC database. Although a direct comparison between PFR kilns to these kilns is not generally applicable as the designs are different, the kilns have NO_x emissions limits in excess of 3.0 lb per ton of lime. Jacksonville Lime is proposing a BACT emissions rate of 2.5 lb NO_x per ton of lime produced, with compliance to be demonstrated through periodic stack testing using EPA Method 7E.

4.3 BACT ANALYSIS FOR SO_2—LIME KILNS

4.3.1 SO_2 FORMATION IN LIME KILNS

In vertical lime kilns, most of the sulfur oxides (mostly SO_2) are formed by oxidation of sulfur in the fuel burned and to a much lesser extent from volatilization of trace amounts of sulfur in the feed material. Composition of the feed materials, quality of lime being manufactured, fuel used to fire the kiln, amount of oxygen, and temperature of the kiln are variables that could affect the amount of SO_2 produced. The following are two primary reactions:

$$CaCO_3 \rightarrow CaO + CO_2$$

$$CaO + SO_2 + \frac{1}{2} O_2 \rightarrow CaSO_4$$

Uncalcined limestone may also capture SO_2 as follows:

$$CaCO_3 + SO_2 + \frac{1}{2} O_2 \rightarrow CaSO_4 + CO_2$$

Much of the SO_2 is not released due to inherent scrubbing of the lime kiln process, especially when preheaters are involved, even without any add-on control device. Therefore, the kiln itself can be thought of as a dry scrubber for SO_2.

4.3.2 AVAILABLE SO_2 CONTROL TECHNOLOGIES

Candidate SO_2 control options identified from the RBLC database search and the literature review include inherent dry scrubbing (with preheater kiln design), wet scrubbing, semiwet scrubbing, low sulfur fuel, and emerging technologies.

It should be noted that control technologies for cement kilns, boilers, or even rotary kilns are not transferrable to the vertical lime kilns. Therefore, some of control technologies feasible for those sources such as limestone or sorbent injection were not evaluated. A description of each of the listed control technologies, along with their respective control effectiveness and technical feasibility, is provided in the following subsections.

4.3.2.1 Inherent Dry Scrubbing

SO_2 is adsorbed onto the particles in the kiln and are later removed by a PM control device such as a baghouse. The degree of natural SO_2 scrubbing depends on several factors such as type of limestone, amount of CO_2 present, and pressure and temperature of the kiln. Kilns with preheaters are capable of removing more than 90 percent of SO_2 emissions. If the oxidation process is enhanced by increasing oxygen levels in the kiln, some sulfur will be oxidized to sulfur trioxide instead of SO_2. Since sulfur trioxide can react with lime and lime dust more readily than SO_2, SO_2 removal efficiency can increase accordingly, but there will also be more sulfur in the product. Inherent dry scrubbing is an integral part of the lime kiln.

4.3.2.2 Wet Scrubbing

Wet SO_2 scrubbers operate by flowing the flue gas upward through a large reactor vessel that has an alkaline reagent (e.g., limestone, lime slurry, soda ash, caustic, ammonia) flowing down from the top. Water can also be used but it is not as effective as an alkaline reagent. The scrubber mixes the flue gas and alkaline reagent, using a series of spray nozzles to distribute the reagent across the scrubber vessel. In the case of limestone or lime slurry, the calcium in the reagent reacts with the SO_2 in the flue gas to form calcium sulfite and/or calcium sulfate ($CaSO_4$) that is removed from the scrubber with the sludge and is disposed. Most wet scrubbing systems use forced oxidation to assure that only calcium sulfate sludge is produced. Wet scrubbing is a technically feasible option for controlling SO_2 emissions from a lime kiln, with a typical efficiency of 90 percent.

4.3.2.3 Semiwet Scrubbing

Semiwet scrubbing is not listed in the RBLC database for SO_2 removal in the lime industry. However, it is a technically feasible control option. A semiwet scrubber such as the one manufactured by Solios Environmental, Inc., can remove SO_2 emissions by 90 percent by injection of hydrated lime and water in a Venturi reactor. The process of semiwet scrubbing forms a dry waste product (i.e., $CaSO_4$) that is collected in a baghouse.

4.3.2.4 Low-Sulfur Fuel

Limiting fuel sulfur content is a potentially technically feasible option for limiting SO_2 emissions and is found in the RBLC database as BACT for SO_2 in a lime kiln.

With respect to low-sulfur coal, the coal to be fired in the vertical kilns must have a low free swelling index (FSI) to avoid plugging the fuel firing lances. FSI is a measure of increase in volume of the coal when heated under controlled conditions. The low-sulfur coals typically do not have low FSI and, therefore, were determined to be technically infeasible for fuel in the vertical kilns. Furthermore, there is no coal (including low-sulfur coal) in the eastern United States that has low FSI (less than 5). Therefore, low-sulfur coal with a low FSI must be brought from across the United States.

Coke is a bottom product of the refining process. As such, the sulfur content varies significantly based on the sulfur content of the crude oil processed and guarantees of sulfur content would require blending of stockpiles at the refinery. Therefore, sulfur contents are expressed as ranges. Jacksonville Lime anticipates the sulfur content of petcoke to be between 5 and 7 weight percent. The proposed sulfur limit for the kilns are 3 percent sulfur in coal and 5.2 percent sulfur in petcoke (or 1.31 lb of SO_2 per ton of lime produced).

In general, lower sulfur solid fuels are less available and more costly due to the demand in many industries/uses. In addition, the nature of the PFR lime kiln process inherently removes fuel sulfur unlike traditional combustion processes. As the kiln is a dynamic process, the sulfur removal is not a linear relationship. For this reason, reductions in fuel sulfur in lime kilns may not result in direct reductions of SO_2 from the process. This is a far different result than traditional combustion sources (e.g., boilers).

4.3.2.5 Emerging Technologies

Comply 2000 System developed by ECO Power Solutions and Tri-NO_x® Multichem system developed by Tri-Mer Corporation are technologies that can control both NO_x and SO_2 concurrently. Comply 2000 System uses a fogging spray mixed with hydrogen peroxide to control SO_2 emissions. This process will generate wastewater, which has to be treated. The Tri-NO_x® Multichem system is an oxidation/reduction scrubbing system described earlier in Section 4.2.2.6 and will require reheating of the exhaust gas stream. Neither system has been successfully applied to vertical PFR kilns. Both are currently considered technically infeasible for the proposed kilns due to lack of experience and track record. Furthermore, cost effectiveness of the systems will exceed $15,000 lb per ton.

4.3.3 PROPOSED BACT FOR SO_2—LIME KILNS

All of the SO_2 BACT technologies discussed in the previous subsection, except for the emerging technologies, are technologically feasible. The next step in the top-down BACT assessment procedure is to evaluate the most effective of these remaining options and document the results. This has been performed on the basis of economic, energy, and environmental considerations, and is described in the following paragraphs.

Notwithstanding the fact that a fuel sulfur reduction strategy on the proposed PFR lime kilns would result in a partial reduction of SO_2 emissions, Jacksonville Lime has made a preliminary economic assessment should such fuel sulfur reduction strategy be applied:

- For coal, the comparison was 3 percent sulfur coal and 1.2 percent sulfur coal. Based on the heat input needs of the kilns, the incremental cost effectiveness of emissions reductions is approximately $10,059 per ton of SO_2 removed (see Table F-5 of Appendix F). However, it is important to note that the cost analysis assumes that the lower sulfur coal is suitable to be fired in the kilns.

- Jacksonville Lime is aware of only one reliable source of low-sulfur (i.e., less than 4 percent) coke (a refinery in Bakersfield, California). However, due to the significant transportation costs for cross country shipment of the fuel (in addition to the higher price of the fuel), the costs of reduction would be excessive.

Similarly, the use of natural gas is technically feasible, but is not cost effective as shown in Table F-6 of Appendix F. Based on average fuel prices for the past 5 years, the incremental cost-effectiveness of using natural gas and using petcoke is high ($25,084 per ton of SO_2 removal). Moreover, natural gas prices tend to be more volatile than coal or petcoke prices. Therefore, the use of low-sulfur fuels is not selected as BACT at this time.

The sludge from wet scrubbing creates a solid waste handling and disposal problem. This sludge must be handled in a manner that does not result in groundwater contamination. Also, the sludge disposal area needs to be permanently set aside from future surface uses since the disposed material cannot bear any weight from such uses as buildings or cultivated agriculture. Other disadvantages associated with wet scrubbing with lime include creation of a visible plume of water droplets, generation of more PM causing elevated opacity, increased water consumption, and wastewater disposal issues. A wet scrubbing system will cost more than $10,000 per ton of SO_2 removed as shown in Tables F-7 and F-8 of Appendix F. Along with the previously mentioned unfavorable environmental and economic impacts, wet scrubbing is considered to be highly uneconomical. Therefore, wet scrubbing for SO_2 control and does not constitute BACT for this project.

The performance of a semiwet system is sensitive to operating conditions, and its performance cannot be assured without additional temperature control devices. Environmental disadvantages of this system include water usage and production of dry waste, which requires landfill disposal. A cost estimate prepared of a semiwet scrubbing system, and is also shown in Tables F-9 and F-10 Appendix F. The calculated cost effectiveness for such a system is found to be more than \$10,000 per ton of SO_2 removed, which is above what is considered reasonable for BACT. Therefore, semiwet scrubbing for SO_2 control and is not selected as BACT for this proposed lime kilns.

Table 4-2 summarizes the SO_2 control options evaluated and their respective control efficiencies and cost effectiveness.

Based on the information provided in this subsection, the only remaining technologically feasible alternative of inherent dry scrubbing is selected as BACT for the proposed kilns. Compliance will be demonstrated by monitoring and keeping records of fuel sulfur content.

4.4 BACT ANALYSIS FOR CO—LIME KILNS

4.4.1 CO FORMATION IN LIME KILNS

CO from lime kilns can be generated from two independent sources: as an intermediate by-product of incomplete combustion of the carbonaceous fuel and of incomplete combustion/oxidation of carbon in the limestone. Conditions leading to incomplete combustion include insufficient oxygen availability as in rich fuel/air mixtures, poor fuel/air mixing (i.e., fuel combustion inefficiency), reduced combustion temperature, reduced combustion gas residence time, and load reduction.

4.4.2 AVAILABLE CO CONTROL TECHNOLOGIES

Candidate control options identified from the RBLC database search and the literature review include those classified as pollution reduction techniques. CO reduction options include thermal oxidation, oxidation catalyst, and good combustion techniques. These control technologies are discussed in the following subsections.

4.4.2.1 Thermal Oxidation

Thermal oxidizers are typically used for VOC control by oxidizing the VOC to CO_2. However, this method of destruction can also be used to oxidize CO to CO_2. The oxidation occurs at high temperatures (approximately 1,500°F). Since there are no demonstrated applications of thermal oxidation on lime kilns, thermal oxidization can be considered

Table 4-2. Comparison of Control Options for SO_2

Control Technology	Potential Control Efficiency (%)	Cost Effectiveness ($ per ton removed)
Lower sulfur fuels	Varies with sulfur content Fuels compared	25,084 (incremental natural gas versus 6-percent sulfur petcoke)
Wet scrubbing lime	Up to 98	11,837
Semiwet scrubbing (spray dry absorber)	Up to 90	10,508
Inherent dry scrubbing	90 to 95	Not applicable

Source: ECT, 2013.

technically infeasible. However, Jacksonville Lime has conservatively elected to continue evaluation of the technology in the BACT analysis.

4.4.2.2 Oxidation Catalyst

CO emissions resulting from the process can potentially be decreased via an oxidation catalyst control system. The oxidation is carried out by the following overall reaction:

$$CO + \frac{1}{2}O_2 \rightarrow CO_2$$

This reaction is promoted by several noble metal-enriched catalysts at high temperatures. Under optimum operating temperatures, this technology can generally achieve approximately 95-percent reduction efficiency for CO emissions.

Oxidation efficiency also depends on exhaust flow rate and composition. Residence time required for oxidation to take place at the active sites of the catalyst may not be achieved if exhaust flow rates exceed design specifications. Catalyst fouling can occur slowly under normal operating conditions and is accelerated by even moderate sulfur concentrations in the exhaust gas. The catalyst may be chemically washed to restore its effectiveness, but eventually irreversible degradation occurs. The catalyst replacement time frame varies depending on type and operating conditions.

Catalytic oxidation for the reduction of CO is a technically infeasible control technique for the proposed project. The oxidation catalyst must be installed downstream of the particulate control device to ensure that the catalyst is not chemically damaged. However, given the nature of the exhaust stream from the kilns, SO_2 and PM emissions, which can be influenced by raw material characteristics, could potentially result in dust buildup on the catalyst, which would greatly limit the effectiveness of this control technique.

4.4.2.3 Good Combustion Techniques

Ensuring that the temperature, oxygen availability, and residence time are adequate for complete combustion minimizes CO formation. This technique includes following manufacturer's operating instructions and/or developing internal procedure to assure that the kilns are operated within the appropriate oxygen range and temperature ranges.

Research of lime kilns could find no reference of add-on control technologies used for control of CO emissions, with the most common control technology listed as use of good combustion and good engineering practices.

4.4.3 PROPOSED BACT FOR CO—LIME KILNS

Of the three CO BACT technologies discussed previously, the remaining (i.e., technologically feasible) control technologies are thermal oxidation and good combustion techniques. The next step in the top-down BACT assessment procedure is to evaluate the most effective of these remaining options and document the results. This has been performed on the basis of economic, energy, and environmental considerations, and is described in the following paragraphs.

Jacksonville Lime performed a simplified cost analysis for evaluating the cost of control of thermal oxidation. In this simplified analysis shown in Table F-11 of Appendix F, only the annual cost of natural gas associated with reheating the exhaust stream was calculated. Annual costs associated with maintenance, electricity, and capital costs of additional equipment (oxidation unit, etc.) were not included. Therefore, the calculated annual costs are conservatively low. Even then, the cost effectiveness of controlling CO with thermal oxidation can approach $10,000 per ton of CO reduced.

Energy impacts associated with use of this technology would include combustion of natural gas to reheat the flue gas, also leading to subsequent environmental impacts from use of natural gas leading to additional pollutant emissions (CO, NO_X, etc.), as well as additional GHG emissions (in the form of CO_2 emissions) from the oxidation of CO. Also, as mentioned previously, there is no reported use of such technologies on similar sources such as the kilns to be installed at the Jacksonville Lime facility. Use of thermal oxidation for control of CO emissions from such a source would be considered experimental. Therefore, the cost estimates provided would likely increase due to the potential for additional research and technology modifications for implementation of the technology on a source such as the proposed PFR kilns at the Jacksonville Lime facility. Therefore, Jacksonville Lime has determined that use of thermal oxidation is not BACT for this project, based on the environmental, energy, and economic analyses.

The only remaining technology is the application of good design and operating practices, which is a logical option, since a properly designed and operated burner design within the kiln can effectively minimize CO formation. This is done by good design of the kiln and effective operating engineering practices that promote complete combustion. An environmental impact of good combustion techniques to reduce CO emissions is the potential to increase NO_x emissions. Due to the nature of each pollutant's formation mechanism (e.g., excess air reduces CO formation, but increases NO_x formation), lower CO emissions could result in higher NO_x emissions, and the design must consider this trade-off. In conclusion, good design and operating practices is selected as BACT for CO for the proposed kilns, which, in terms of numerical limit, is 3.0 lb of CO per ton of lime produced. Compliance with this BACT standard can be demonstrated through periodic stack testing using EPA Reference Method 10.

There are several preheater and rotary style kilns with lower BACT limits on a lb-per-ton product basis. However, due to the design of these kilns, these units operate the combustion chamber at a higher temperature, which results in inherently lower CO emissions. Therefore, a direct comparison between the limits is not appropriate. The most comparable similar source to the Jacksonville Lime facility in the Unites States is Chemical Lime's Clifton, Texas, facility. The facility has established BACT CO emissions limits of 3.5 lb of CO per ton of lime produced for a vertical lime kiln firing petcoke and coal. The proposed 3.0 lb CO per ton of lime produced (or 1.3 kilograms) of CO per metric ton of lime produced) is also in line with the best available technique for CO control from PFR kilns established by the IPPC in December 2010, which is 5 kilograms of CO per metric ton of lime produced.

Table 4-3 summarizes the CO control options evaluated and their respective control efficiencies and cost effectiveness.

Table 4-3. Comparison of Control Options for CO

Control Technology	Potential Control Efficiency (%)	Cost Effectiveness ($ per ton removed)
Thermal oxidation	90	7,300 to 11,002 (incremental, depending on natural gas prices)
Good combustion controls	Base case	Not applicable

Source: ECT, 2013.

4.5 BACT ANALYSIS FOR PM/PM_{10}/$PM_{2.5}$—LIME KILNS

4.5.1 PM FORMATION IN LIME KILNS

PM/PM_{10}/$PM_{2.5}$ emissions are generated from calcining of limestone in the kiln, which releases constituents in the limestone raw material, as well as from the combustion of fuel. The kiln is a point source of particulate emissions.

4.5.2 AVAILABLE PM CONTROL TECHNOLOGIES

Candidate control options identified from the RBLC database search and the literature review include those classified as pollution reduction techniques. Application of a control technology differs for point sources and fugitive sources. PM reduction options from point sources include a baghouse, an ESP, wet scrubbing, and a Venturi scrubber. These control technologies are discussed in the following subsections.

4.5.2.1 Baghouse

A baghouse consists of several fabric filters, typically configured in long, vertically suspended sock-like configurations. Dirty gas enters from one side, often from the outside of the bag, passing through the filter media and forming a particulate cake. The cake is removed by shaking or pulsing the fabric, which loosens the cake from the filter, allowing it to fall into a bin at the bottom of the baghouse. The air cleaning process stops once the pressure drop across the filter reaches an economically unacceptable level. Typically, the trade-off to frequent cleaning and maintaining lower pressure drops is the wear and tear on the bags produced in the cleaning process. A baghouse can generally achieve PM reduction efficiency in excess of 99 percent.

4.5.2.2 Electrostatic Precipitator

An ESP removes particles from an air stream by electrically charging the particles and then passing them through a force field that causes them to migrate to an oppositely charged collector plate. After the particles are collected, the plates are knocked ("rapped"), and the accumulated particles fall into a collection hopper at the bottom of the ESP. The collection efficiency of an ESP depends on particle diameter, electrical field strength, gas flow rate, and plate dimensions. An ESP can be designed for either dry or wet applications. An ESP can generally achieve approximately 99- to 99.9-percent reduction efficiency for PM emissions.

4.5.2.3 Wet Scrubber

A wet scrubber removes PM by impacting the gas stream with the scrubbing solution. Inertial and diffusional interception are two primary PM removal mechanisms. This technology generates wastewater and sludge disposal problems along with substantial energy requirements for pumping water and exhausting the cooled air stream out the stack. The control efficiency offered by wet scrubbing is not as high as the baghouse or ESP and is dependent on several parameters such as liquid to gas ratio and particle size distribution of the inlet gas stream. A wet scrubber can achieve 40- to 90-percent reduction efficiency for PM emissions.

4.5.2.4 Venturi Scrubber

A Venturi scrubber, a special type of wet scrubber, typically consists of three sections: a converging section where the inlet gas stream enters, a throat section where the gas velocity increases, and a diverging section. Liquid (typically water) is introduced either at the throat or the converging section. Since the gas stream is forced to move at high velocities in the throat section, the liquid is sheared, producing large quantities of tiny droplets. These tiny liquid droplets will remove PM usually in the throat section. The gas stream slows down as it exits through the diverging section. The wastewater must be properly treated. A Venturi scrubber can achieve higher control efficiency than a typical wet scrubber but requires high pressure drops. Typical efficiency range is approximately 70 to 99 percent and generally higher for PM with aerodynamic diameters between 0.5 and 5 micrometers.

4.5.3 PROPOSED BACT FOR PM—LIME KILNS

All of the PM BACT technologies discussed previously are technologically feasible. The next step in the top-down BACT assessment procedure is to evaluate the most effective of these options and document the results.

If the top-ranked control technology with the highest removal efficiency is accepted as BACT and collateral environmental impacts (i.e., potential impacts of unregulated air pollutants or potential impacts in other media) are not unacceptable, the top-ranked control technology is proposed as BACT, and no economic analyses are necessary. This is the case for PM control for the proposed lime kilns.

A review of the RBLC database demonstrates that baghouses are widely accepted as BACT for control for PM emissions from lime kilns. The RBLC database does not show any vertical lime kilns permitted since 2000 with PM/PM_{10}/$PM_{2.5}$ BACT limits. The typical emissions limit for PM for lime kilns in general is 0.01 gr/dscf. Compliance demonstration of the limit is generally based on EPA Reference Method 5, or Method 201 or 201A (front half only). As such, the PM emissions limits are perceived to be indicative of filterable emissions only and not inclusive of total (filterable and condensable) PM emissions.

Condensable PM, resulting from organic and inorganic (e.g., sulfates) constituents in the limestone and fuel, has been estimated based on a stack test using EPA Method 202 at Carmeuse's Winchester facility. The condensable emissions will be effectively controlled through inherent scrubbing, which is part of the design of the vertical kiln. The total (filterable and condensable) proposed PM/PM_{10}/$PM_{2.5}$ limit is proposed as 0.303 lb per ton of lime. Compliance will be demonstrated through periodic stack testing per EPA Methods 5, 201/201A, and 202. Jacksonville Lime proposes to demonstrate compliance with the BACT limits in conjunction with the compliance demonstration for the Lime MACT emissions limits.

Table 4-4 summarizes the PM control options evaluated and their respective control efficiencies and cost effectiveness.

4.6 BACT ANALYSIS FOR GHG—LIME KILNS

As proposed in the previously submitted GHG BACT application, using energy efficient technology, the GHG BACT emissions limit of 1.3 tons of CO_2e per ton of lime produced based on a 12-month rolling average is still valid.

Table 4-4. Comparison of Control Options for PM

Control Technology	Potential Control Efficiency (%)	Cost Effectiveness ($ per ton removed)
Baghouse or ESP	99+	Not applicable
Wet scrubber	40 to 90	Not applicable
Venturi scrubber	70 to 99	Not applicable

Source: ECT, 2013.

4.7 BACT ANALYSIS FOR STARTUP AND SHUTDOWN PERIODS

Jacksonville Lime has proposed a baghouse for PM control, which will operate at all times, including periods of startup or shutdown. Therefore, the BACT evaluation of startup and shutdown emissions will address other pollutants, primarily CO and NO_x.

It is important to note that startup of the kilns is limited to cold startups, which is expected to occur only when major maintenance of the kilns is required. During cold shutdown for extended maintenance, the fuel source is eliminated before lime is removed. Generally, the kilns will be maintained as near operating temperature as possible during periods of idling for routine maintenance by containing the heat within the kiln. During this idling mode, no fuel will be fired, and no lime production will occur. The kilns can be maintained in this state for 2 to 3 days.

The proposed kilns will use natural gas as a startup fuel to reach the desired operating temperature. It is only after the necessary temperature for fuel combustion and lime production is reached that another fuel would be used, at which time both chambers of the kiln will be filled with limestone and/or partially calcined lime. It is anticipated that a cold startup could last up to several days. Use of natural gas during cold startups will minimize emissions during startup. There will be some CO and NO_x emissions during the startup periods, but they will be less than those during normal operations. PM, VOC, and SO_2 emissions during the startup periods will be minimal. Therefore, Jacksonville Lime proposes the use of natural gas during cold startups as BACT.

4.8 BACT ANALYSIS FOR ANCILLARY EQUIPMENT

4.8.1 MATERIAL HANDLING SOURCES

There are multiple proposed material handling sources such as enclosed transfer points, screens, crushers, and storage bins and potential fugitive sources such as piles, roads, unenclosed material transfer points, etc., that result in $PM/PM_{10}/PM_{2.5}$ emissions. Handling of the limestone raw material, fuel, and lime product can result in airborne PM from fugitive and point sources.

Application of a control technology differs for point sources and fugitive sources. PM reduction options from point sources include baghouse, ESP, wet scrubber, and Venturi scrubber. These control options have been described previously in Section 4.5.2. PM reduction options from fugitive sources include wet suppression, sweeping, and reasonable precautions. Wet suppression reduces the PM emissions either by direct contact between the particles within the air and spray droplets or by binding the smaller particles to the surface of the material.

The previously mentioned options are technically feasible for control of PM from material handling. For point sources, the highest control efficiency is achieved by using a baghouse with a control efficiency of 99 percent or greater. For certain fugitive sources (e.g., storage piles), baghouses, ESPs, and scrubbers are not technically feasible, and wet suppression would offer the highest control for these sources.

Jacksonville Lime has determined that using the top level control technology (i.e., baghouse) for point sources is BACT. For non-point sources, Jacksonville Lime will minimize fugitive dust emissions by taking reasonable precautions (e.g., washing the trucks, having speed limits on haul roads, installing partial or full enclosures, and using wet suppression techniques as needed).

4.8.2 FUEL DRYER

The proposed Jacksonville Lime facility will have a small (3.5-MMBtu/hr coal/petcoke mill heater). The unit will combust natural gas and will be routed to a baghouse. Due to the small size and low emissions (0.6 tpy of CO and 1.4 tpy of NO_x), Jacksonville Lime performed a limited BACT analysis for this unit for these pollutants. The $PM/PM_{10}/PM_{2.5}$ BACT analysis for this unit is as previously described in Section 4.5, since the PM emissions from the heater is controlled by a baghouse, along with the PM emissions from the mill exhaust.

The only technically and/or economically feasible CO or NO_x control technologies for combustion units of this size with these low levels of emissions are firing natural gas as fuel and using good combustion practices. Jacksonville Lime has determined previously in the GHG BACT analysis that the only technically and economically feasible control options for the fuel dryer for GHG emissions are also exclusive use of natural gas and efficient combustion techniques.

4.8.3 EMERGENCY GENERATORS

Jacksonville Lime does not propose to make use of emergency generators at this time.

4.9 SUMMARY OF PROPOSED BACT

Table 4-5 lists the selected BACT technology for each emissions unit and applicable pollutant. Table 4-6 subsequently shows the corresponding emissions or operating limits and the method that will be used to determine compliance with the specified limit. It should be noted that the BACT emissions limits are per emissions unit.

Table 4-5. Summary of Proposed BACT Technologies

Emissions Unit(s)	Pollutant(s)	Selected BACT
Vertical lime kiln	CO	Good combustion practices
	NO_x	Good combustion practices
	SO_2	Inherent scrubbing
	PM/PM_{10} + condensable PM	Baghouse
	$PM_{2.5}$ + condensable PM	Baghouse
	GHG	Kiln design and good combustion practices
Fuel heater	CO, NO_x, SO_2, GHG	Exclusive use of natural gas and good combustion practices
	$PM/PM_{10}/PM_{2.5}$	Baghouse
Material handling (fugitive)	$PM/PM_{10}/PM_{2.5}$ (filterable)	Reasonable precautions, including wet suppression as needed
Material handling (nonfugitive)	PM/PM_{10} (filterable)	Baghouse
	$PM_{2.5}$ (filterable)	Baghouse

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table 4-6. Summary of Proposed BACT Emissions Limits

Emissions Unit(s)	Pollutant(s)	Emissions/Operating Limit	Compliance Method
		Per ton of lime produced	
Vertical lime kilns	CO	3.0 lb	Method 10
	NO_x	2.5 lb	Method 7 or 7E
	SO_2	1.5 lb	Fuel sulfur content monitoring and recordkeeping
	PM/PM_{10} + condensable PM	0.3 lb	Method 201/201A or 202
	$PM_{2.5}$ + condensable PM	0.3 lb	Method 201/201A or 202
	GHG	1.3 ton CO_2e	Production and fuel monitoring and recordkeeping
		Per $MMft^3$	
Fuel heater	CO	40 lb	Not applicable*
	NO_x	96 lb	Not applicable*
	SO_2	1.5 lb	Not applicable*
	$PM/PM_{10}/PM_{2.5}$	7.6 lb	Not applicable*
	GHG	12,172 lb	Not applicable*
Material handling (fugitive)	$PM/PM_{10}/PM_{2.5}$ (filterable)	Opacity limits as specific in lime MACT	Periodic monitoring and recordkeeping
Material handling (nonfugitive)	PM/PM_{10} (filterable)	0.01 gr/dscf	Vendor literature

Note: $MMft^3$ = million standard cubic feet.

*AP-42 and 40 CFR 98 emissions factors.

Sources: Jacksonville Lime, 2013.
ECT, 2013.

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———. 2002. Air Pollution Control Cost Manual, Sixth Edition. Office of Air Quality Planning and Standards (OAQPS)

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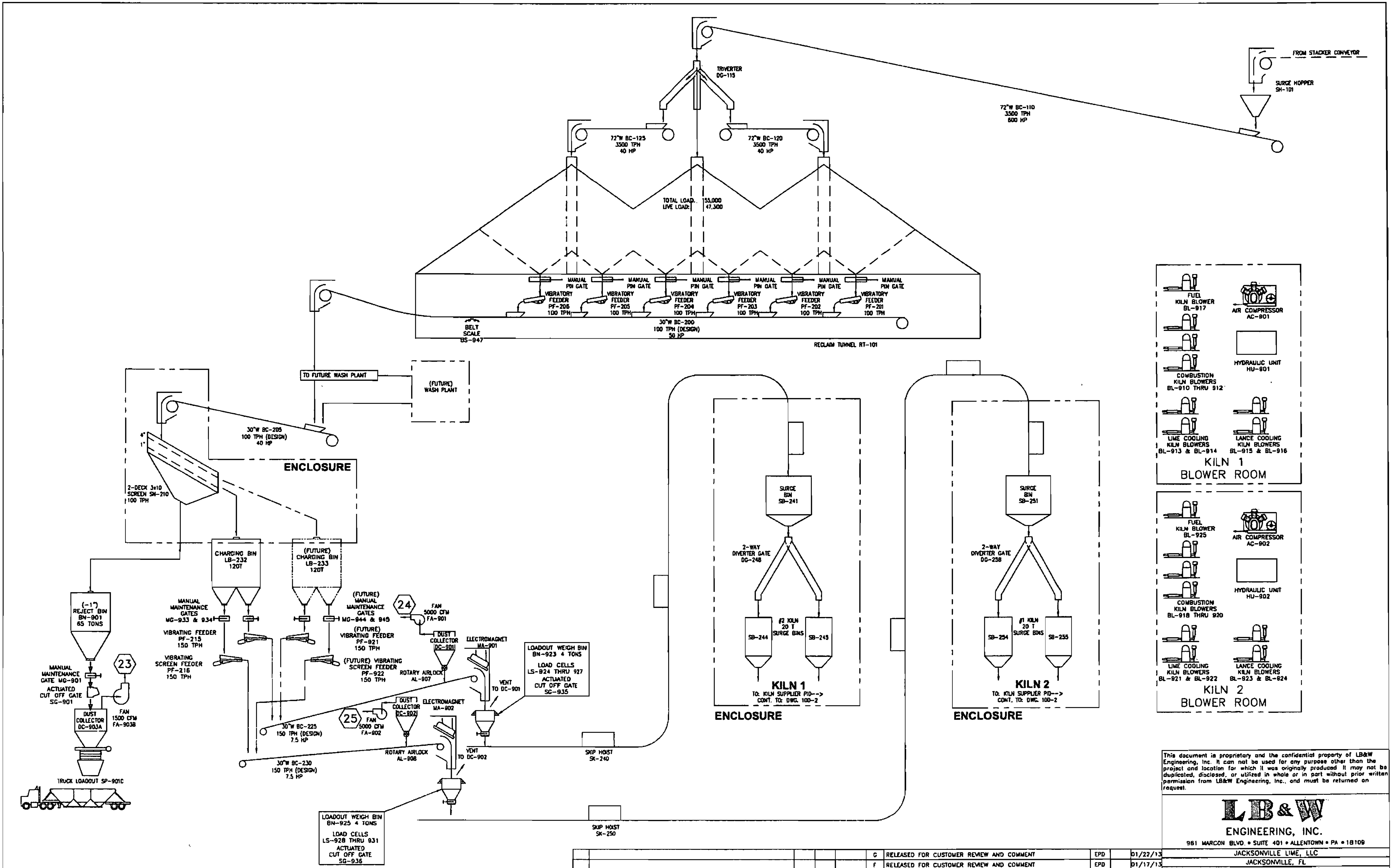
APPENDIX A

PROCESS FLOW DIAGRAMS



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REV NO.	DESCRIPTION OF REVISION	BY	CHK'D	DATE	REV NO.	DESCRIPTION OF REVISION	BY	CHK'D	DATE

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JACKSONVILLE LIME, LLC
JACKSONVILLE, FL
SOUTHEAST KILN PROJECT
GENERAL ARRANGEMENT
STONE HANDLING: RECLAIM & KILN FEED
PROCESS FLOW DIAGRAM - OPTION "A"

DRAWN EPD	CHECKED	LB&W CONTRACT NO. 212108
DATE: 07/06/12	DATE	DRAWING NUMBER 100-1 / REVISION L
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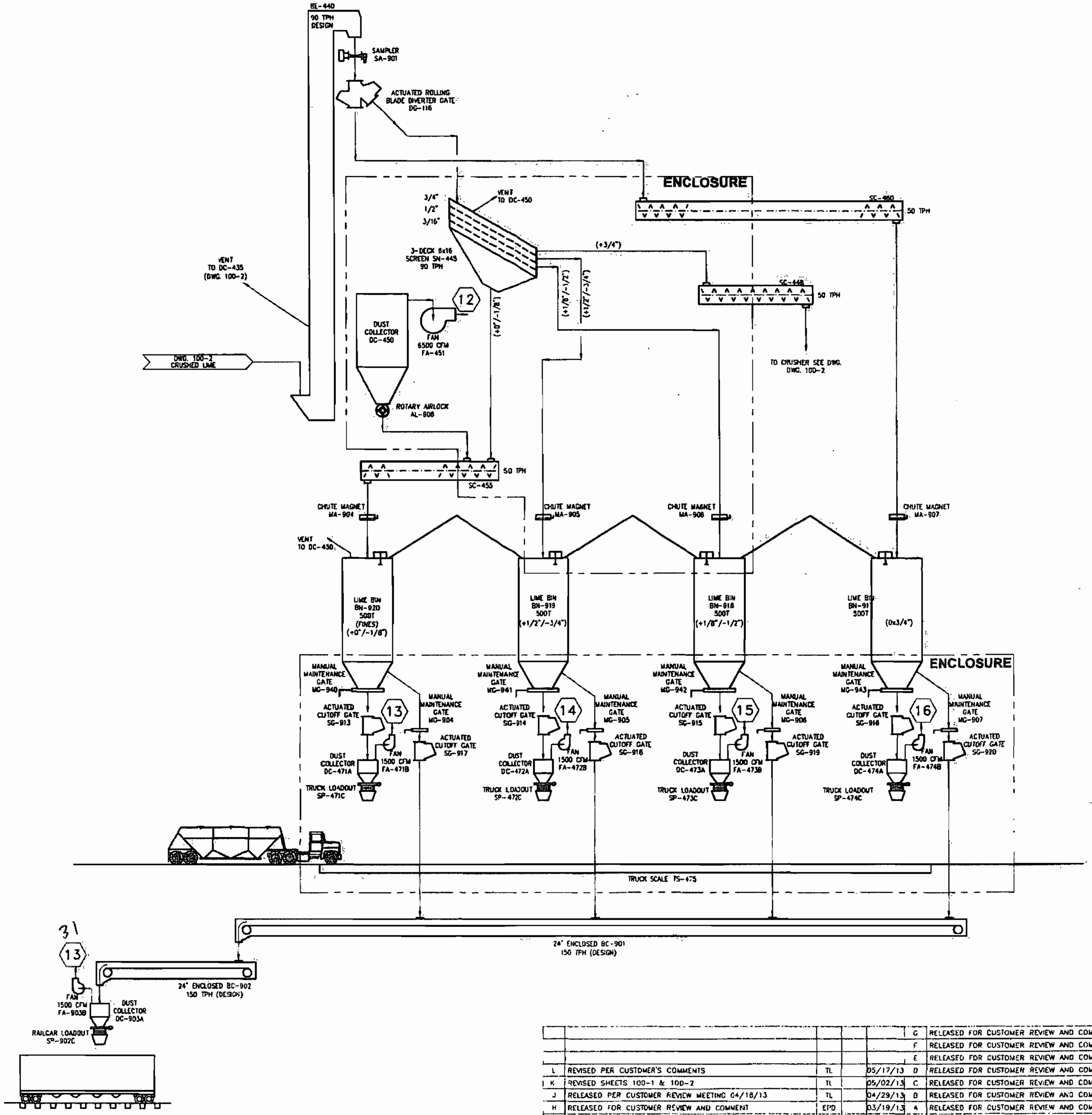

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JACKSONVILLE LIME, LLC
JACKSONVILLE, FL
SOUTHEAST KILN PROJECT
GENERAL ARRANGEMENT
LIME HANDLING: SCREENING & STORAGE
PROCESS FLOW DIAGRAM – OPTION "A"

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					E	RELEASED FOR CUSTOMER REVIEW AND COMMENT	EPD		01/3/13
L	REVISED PER CUSTOMER'S COMMENTS	TL		05/17/13	D	RELEASED FOR CUSTOMER REVIEW AND COMMENT	EPD		12/03/12
K	REVISED SHEETS 100-1 & 100-2	TL		05/02/13	C	RELEASED FOR CUSTOMER REVIEW AND COMMENT	EPD		09/24/12
J	RELEASED PER CUSTOMER REVIEW MEETING 04/18/13	TL		04/29/13	B	RELEASED FOR CUSTOMER REVIEW AND COMMENT	JJK		08/24/12
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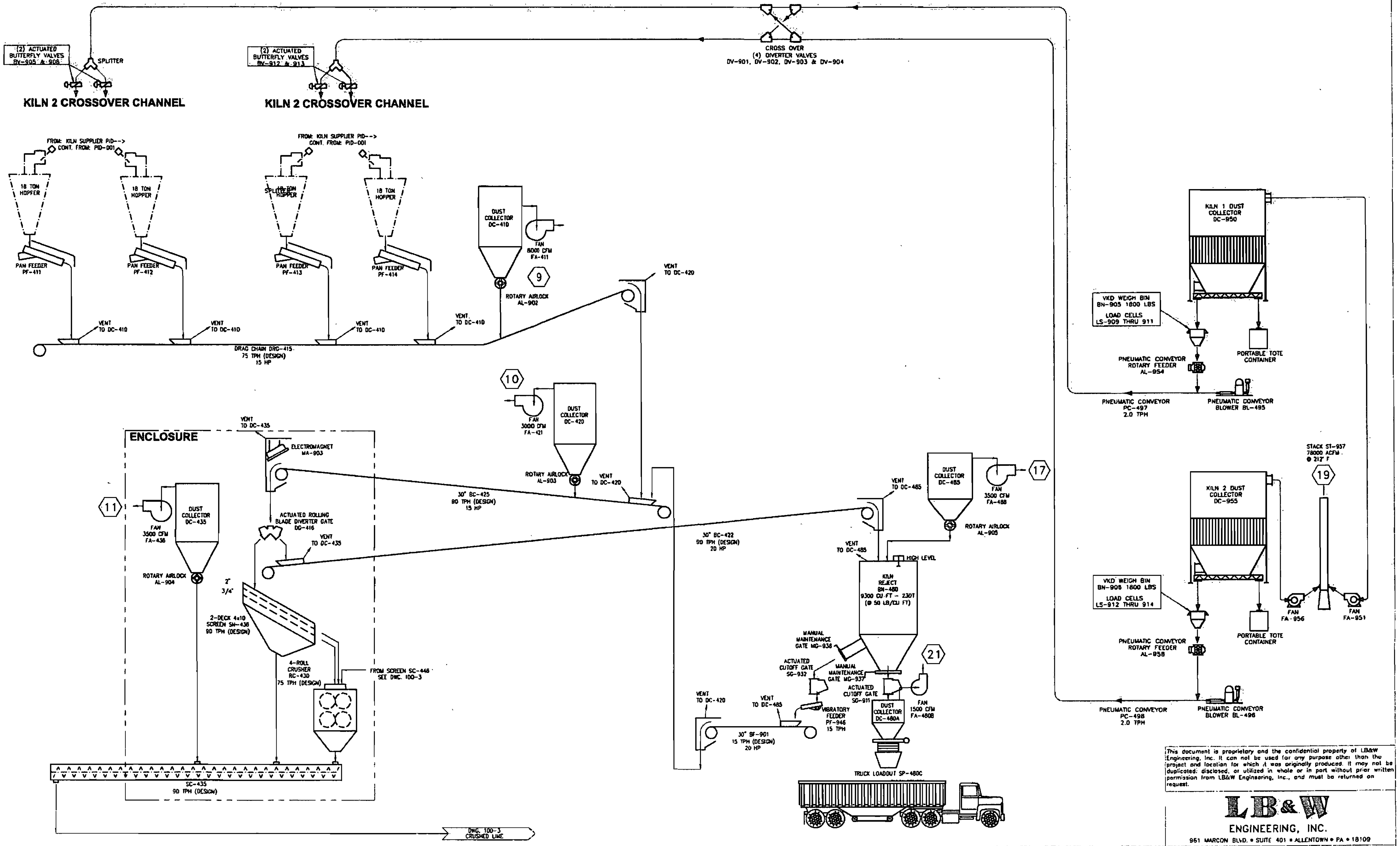

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REV. NO.	DESCRIPTION OF REVISION	BY	CHK'D	DATE	REV. NO.	DESCRIPTION OF REVISION	BY	CHK'D	DATE
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H	RELEASED FOR CUSTOMER REVIEW AND COMMENT	EPD		03/19/13	A	RELEASED FOR CUSTOMER REVIEW AND COMMENT	EPD		07/11/12

JACKSONVILLE LIME, LLC
JACKSONVILLE, FL
SOUTHEAST KILN PROJECT
GENERAL ARRANGEMENT
LIME HANDLING: CRUSHING, REJECTS, & LKD
PROCESS FLOW DIAGRAM – OPTION "A"

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CHECKED
DATE 07/06/12
DATE
SCALE NONE
LB&W CONTRACT NO 212108
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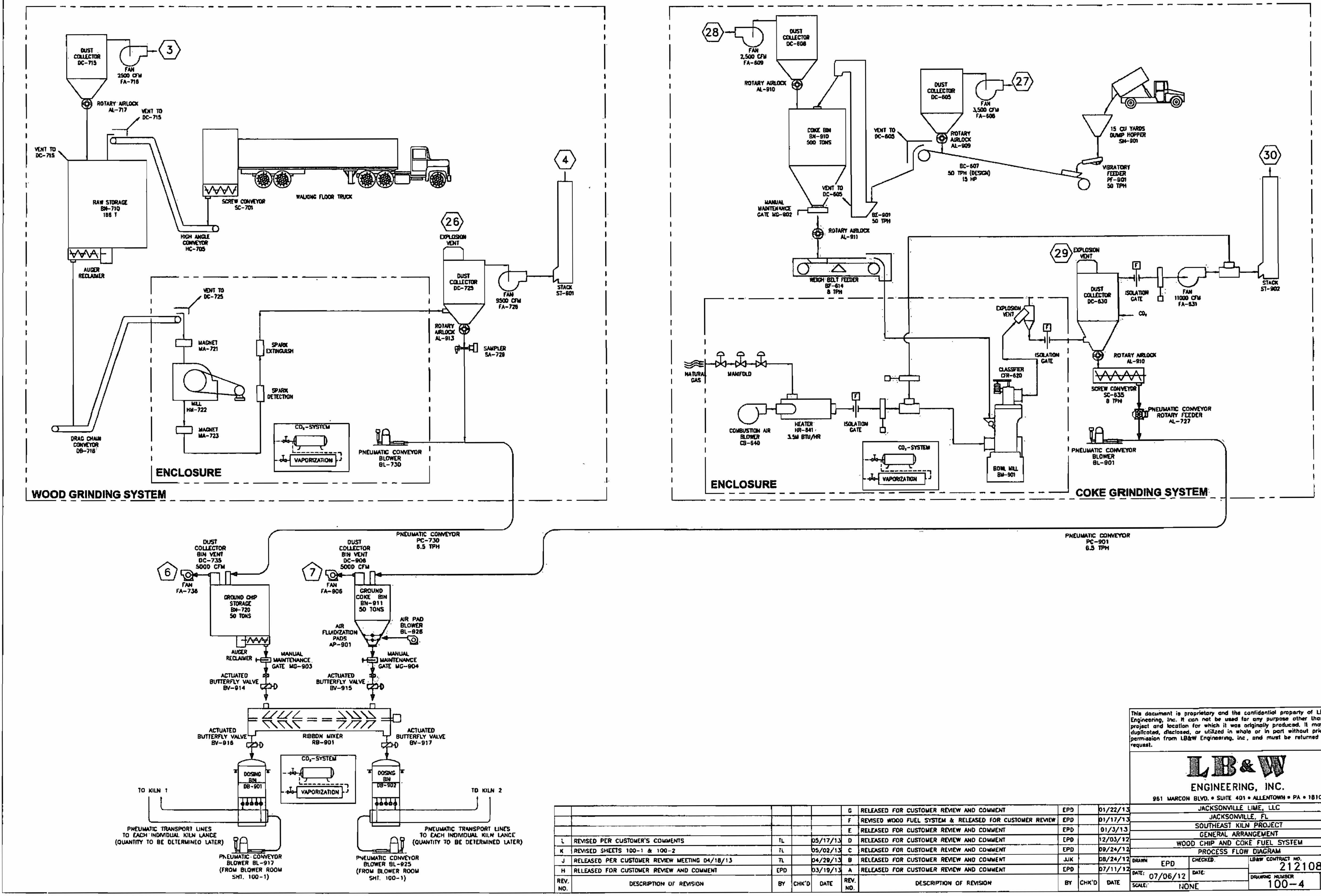

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JACKSONVILLE LIME, LLC
JACKSONVILLE, FL
SOUTHEAST KILN PROJECT
GENERAL ARRANGEMENT
WOOD CHIP AND COKE FUEL SYSTEM
PROCESS FLOW DIAGRAM

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DATE: 07/06/12
DATE:
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APPENDIX B

KILN LITERATURE

APPENDIX C

EMISSIONS CALCULATIONS

Table C-1. Key Process Data

Parameter		Units	Kiln 1	Kiln 2
Manufacturer		-	TBD	TBD
Description		-	Kiln 1	Kiln 2
Lime Stone Feed Rate	120 cycles/day	tph (nominal)	24.5	24.5
		tpd (nominal)	589.0	589.0
		tph (maximum)	29.4	29.4
		tpd (maximum)	706.8	706.8
		tpy (maximum)	257,982	257,982
Lime Production Rate		tpd (nominal)	**330**	**330**
		tpd (maximum)	396	396
		tpy (nominal)	114,428	114,428
		tpy (maximum)	137,313	137,313
Fuel Consumption	Pet Coke (Primary)	tph (nominal)	1.8	1.8
		tph (max.)	2.2	2.2
	Coal (Backup)	tph (nominal)	1.9	1.9
		tph (max.)	2.3	2.3
	Lignite (Backup)	tph (nominal)	3.4	3.4
		tph (max.)	4.1	4.1
	Natural Gas (Backup)	ft^3/min (nominal)	786.0	786.0
		ft^3/min (max.)	943.2	943.2
	Wood Chips (Backup)	tph (nominal)	2.5	2.5
		tph (max.)	3.1	3.1
Fuel Sulfur Content	Coke	% weight (max.)	**5.2**	**5.2**
	Coal	% weight (max.)		
	Lignite	% weight (max.)		
	Natural Gas	% weight (max.)		
	Wood Chips	% weight (max.)		
Fuel Heat Content	Coke	Btu/lb (HHV)	12,400	12,400
	Coal	Btu/lb (HHV)	12,465	12,465
	Lignite	Btu/lb (HHV)	7,105	7,105
	Natural Gas	Btu/ft^3 (HHV)	1,026	1,026
	Wood Chips	Btu/lb (HHV)	8,740	8,740
Hours of Operation	daily (maximum)	hr/dy (maximum)	24	24
		dy/yr (maximum)	**357**	**357**
	annual (nominal)	hr/yr (expected)	8,568	8,568
	annual (maximum)	hr/yr (max)	8,760	8,760

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table C-2. Estimated Kiln Emissions

Pollutant	Emissions Factor (lb/ton lime produced)	Source of Emissions Factor	Two Kilns (tpy)	Each Kiln (lb/hr)
PM (filterable)	0.12	1, 2	24.85	2.99
PM_{10} (filterable+condensable)	0.30	1, 2	41.61	5.00
$PM_{2.5}$ (filterable+condensable)	0.30	1, 2	41.61	5.00
SO_2	1.311	4	180.07	21.64
NO_x	2.5	3	343.28	41.25
CO	3.0	3	411.94	49.50
VOC	0.14	3	19.22	2.31
Lead	0.000055	5	0.01	0.001
Mercury	0.000011	5	0.001	0.0002
Reduced Sulfur Compounds	Neg.			
HCl	0.16	5	21.51	2.59
HF	0.020	5	2.69	0.32
H_2SO_4	0.012	6	1.63	0.20
GHGs	2600	7	357,014	42,900

Note:

1 - PM condensable test conducted at Carmeuse Lime & Stone, Winchester Operation in November 2006 using EPA Method 202.

2 - Filterable PM based on bag filter outlet grain loading rate of .01 grains per dry standard cubic foot (gr/dscf). Assumes all PM = $PM_{2.5}$.

3- Engineering estimate based on kiln design and emissions from similar kilns.

4 - SO_2 emission factor from Carmeuse for worst case fuel, i.e., coke, at 5.2% sulfur.

5 - Emissions factors from EPA AP-42 Section 1.1, Bituminous and Subbituminous Coal Combustion (9/98). lb/ton coal converted to lb/ton lime.

6 - $EF(H_2SO_4) = EF(SO_2) \times 0.74/100 \times 98/80$.

7 - GHG emission factor based on proposed BACT limit of 1.3 ton per ton of lime produced.

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table C-3. PM/PM_{10}/$PM_{2.5}$ Particulate Emissions

Source #	EU_ID	Item #	Sources Controlled	Stack Type	Flow Rate (scfm)	Flow Rate (acfm)	Outlet Temp (°F)	PM Conc (gr/dscf)	Annual Hours of Operation (hrs)	Emissions					
										PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
BM-3	3	FA-716	Wood Chip Raw Storage Collector	H	2,500	2,500	70	0.01	5358	0.21	0.21	0.11	0.57	0.57	0.29
BM-4	4	FA-726	Wood Chip Process Dust Collector Stack	V	8,252	9,500	150	0.01	5358	0.71	0.71	0.35	1.89	1.89	0.95
BM-6	6	FA-736	Dosing Bin #1	H	5,000	5,756	150	0.01	8760	0.43	0.43	0.21	1.88	1.88	0.94
BM-7	7	FA-906	Dosing Bin #2	H	5,000	5,000	70	0.01	8760	0.43	0.43	0.21	1.88	1.88	0.94
BM-9	9	FA-411	lime handling under kilns	H	10,000	11,512	150	0.01	8760	0.86	0.86	0.43	3.75	3.75	1.88
BM-10	10	FA-421	lime belt transfer to reject	H	3,000	3,454	150	0.01	8760	0.26	0.26	0.13	1.13	1.13	0.56
BM-11	11	FA-436	lime crusher bldg	H	3,500	4,029	150	0.01	8760	0.30	0.30	0.15	1.31	1.31	0.66
BM-12	12	FA-451	top of lime silos / screening	V	6,500	6,500	70	0.01	8760	0.56	0.56	0.28	2.44	2.44	1.22
BM-13	13	FA-471B	lime silo truck loadout spouts	H	1,500	1,500	70	0.01	2190	0.06	0.06	0.03	0.07	0.07	0.04
BM-14	14	FA-472B	lime silo truck loadout spouts	H	1,500	1,500	70	0.01	2190	0.06	0.06	0.03	0.07	0.07	0.04
BM-15	15	FA-473B	lime truck silo loadout spouts	H	1,500	1,500	70	0.01	2190	0.06	0.06	0.03	0.07	0.07	0.04
BM-16	16	FA-474B	lime truck silo loadout spouts	H	1,500	1,500	70	0.01	2190	0.06	0.06	0.03	0.07	0.07	0.04
BM-17	17	FA-486	Reject bin top	H	3,500	4,029	150	0.01	2190	0.30	0.30	0.15	0.33	0.33	0.16
BM-19	19	STACK	Kiln stack*	V	49,448	70,612	294	0.01	8760	5.98	10.00	10.00	16.80	41.60	41.60
BM-21	21	FA-480B	Lime reject bin loadout	H	1,500	1,500	70	0.01	2190	0.13	0.13	0.06	0.14	0.14	0.07
BM-23	23	FA-416	Stone Feed Reject Bin Loadout*	H	1,500	1,500	70	0.01	2190	0.13	0.13	0.06	0.14	0.14	0.07
BM-24	24	FA-901	Kiln 1 Skip Car Loading*	H	5,000	5,000	70	0.01	2498	0.43	0.43	0.21	0.54	0.54	0.27
BM-25	25	FA-902	Kiln 2 Skip Car Loading*	H	5,000	5,000	70	0.01	2498	0.43	0.43	0.21	0.54	0.54	0.27
BM-27	27	FA-606	Coke Conveyor Belt Transfer	H	3,500	3,500	70	0.01	1460	0.30	0.30	0.15	0.22	0.22	0.11
BM-28	28	FA-609	Coke Raw Storage Bin	H	2,500	2,500	70	0.01	1460	0.21	0.21	0.11	0.16	0.16	0.08
BM-30	30	FA-631	Coke Process Dust Collector/FD Stack	V	11,000	11,000	70	0.01	5395	0.94	0.94	0.47	2.54	2.54	1.27
BM-31	31	FA-903B	Lime Railcar Loadout	H	1,500	1,500	70	0.01	2168	0.13	0.13	0.06	0.14	0.14	0.07

Note: PM emissions for the kiln stack is filterable only, and is equal to 5.98 lb/hr and 10.0 tpy.
Except for the kiln stack emissions, $PM_{2.5}$ is assumed to equal 50% of PM_{10}.
Sources BM-19, BM-23, BM-24, and BM-25 are subject to NSPS Subpart OOO, and NESHAP Subpart AAAAA.

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table C-4. Emission Calculation for Fuel Dryer

Jacksonville Lime, LLC	FD

GENERAL DESCRIPTION

Emission Source Descriptio	Fuel Dryer
Emission Control(s):	Dust Collector

EQUATIONS

Emission (lb/hr) = Emission Factor (lb/10^6 scf) x Heat Input (MMBtu/hr) / Heat Content (Btu/scf)

Emission (ton/yr) = Emission Rate (lb/hr) x Operating Hours (hrs/yr) x (1 ton/ 2,000 lb

INPUT DATA AND EMISSION ESTIMATES

Maximum Schedule (hr/dy, d	24	7	52	Expected Schedule (hr/dy, dy/wk, wk/yr):		
Maximum Annual Operating	8,760	hrs/yr		Typical Annual Operating Hours:		hrs/yr
NG Heat Content (LHV):	1,028	Btu/scf		NG Heat Content (LHV):		Btu/scf
Max. Heat Input:	3.50	MMBtu/hr (AHV)		Daily Avg. Heat Input:		MMBtu/hr (AHV)

Pollutant	Emission Factor (lb/10^6 scf)	Potential Emission Rates		Pollutant	Emission Factor (lb/10^6 scf)	Controlled Emission Rates	
		(lb/hr)	(tpy)			(lb/hr)	(tpy)
NO_x	94.0	3.20E-01	1.40E+00	NO_x	94.0		
CO	40.0	1.36E-01	5.96E-01	CO	40.0		
VOC	5.5	1.87E-02	8.20E-02	VOC	5.5		
SO_2	1.5	5.11E-03	2.24E-02	SO_2	1.5		
PM	7.6	2.59E-02	1.13E-01	PM	7.6	2.59E-04	1.13E-03
PM_{10}	7.6	2.59E-02	1.13E-01	PM_{10}	7.6	2.59E-04	1.13E-03
$PM_{2.5}$	7.6	2.59E-02	1.13E-01	$PM_{2.5}$	7.6	2.59E-04	1.13E-03
CO_2 (GHG)	120,054	4.09E+02	1,792	CO_2	120,054		
CH_4 (GHG)	48	1.62E-01	0.71	CH_4 (CO_2e)	1,189		
N_2O (GHG)	70	2.39E-01	1.05	N_2O (CO2e)	20,918		
Lead	5.00E-04	1.70E-06	7.46E-06	Lead	5.00E-04		
Highest HAP	Hexane	6.13E-03	2.68E-02	Highest HAP	Hexane		
Total HAPs		6.43E-03	2.82E-02	Total HAPs			

SOURCES OF INPUT DATA

Parameter	Data Source
Operating Hours	Jacksonville Lime, 2012.
NG Heat Content (Btu/scf, HHV)	Estimated.
Max. Heat Input (MMBtu/hr)	Jacksonville Lime, 2012.
Control Efficiency	Assumed dust collector is 99% effiient for PM control.
Emission Factors	AP-42, Section 1.4, EPA, July 1998.
	GHG emission factors based on 40 CFR 98, Subpart C. GWP = 25 (CH4), 298 (N20)

NOTES

Max. Fuel Usage Rates:	3,405	scf/hr	29.8	MMcf/yr

GHG emissions are CO_2e.

DATA CONTROL

Calculated by:	Daniel Hlaing, ECT	Date:	7/27/12
Reviewed by:	William Karl, ECT	Date:	7/30/12

Table C-5. Annual Emissions Summary, Jacksonville Lime

Pollutant	Emissions (tpy) Kilns 1 & 2	Misc. PM Sources	Fuel Dryer	Total Emissions
Criteria Pollutants				
Nitrogen Oxides (NO_x)	343.3	N/A	1.4	344.7
Sulfur Dioxide (SO_2)	180.1	N/A	2.2E-02	180.1
Particulate Matter (PM)	16.8	19.9	N/A	36.6
PM Less Than 10 Microns (PM_{10})	41.6	19.9	N/A	61.5
PM Less Than 2.5 Microns ($PM_{2.5}$)	41.6	9.9	N/A	51.5
Carbon Monoxide (CO)	411.9	N/A	0.6	412.5
Volatile Organic Compound (VOC)	19.2	N/A	0.1	19.3
Lead (Pb)	0.01	N/A	Negligible	0.01
Hazardous Air Pollutants				
Hydrogen Chloride (HCl)	21.5	N/A	Negligible	21.5
Hydrogen Fluoride (HF)	2.7	N/A	Negligible	2.7
Mercury (Hg)	1.5E-03	N/A	Negligible	1.5E-03
Total Hazardous Air Pollutants (HAPs)	24.2	N/A	Negligible	24.2
Other Pollutants				
Sulfuric Acid Mist (H_2SO_4)	1.6	N/A	Negligible	1.6
Carbon Dioxide (CO_2)	357,013.8	N/A	1,793.6	358,807.4

Note: tpy = ton per year.
N/A = not applicable.
Total HAP emissions include lead.

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table C-6. Maximum Hourly Emission Rates of Jacksonville Lime Sources

EU_ID	Description	UTM (meters)		NO_x		SO_2		PM_{10}		CO	
		East	North	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s
BM-3	Wood Chip Raw Storage Collector	439,320.67	3,359,679.40	N/A	N/A	N/A	N/A	0.214	0.027	N/A	N/A
BM-4	Wood Chip Process Dust Collector Stack	439,335.69	3,359,645.21	N/A	N/A	N/A	N/A	0.707	0.089	N/A	N/A
BM-6	Dosing Bin #1	439,334.43	3,359,621.34	N/A	N/A	N/A	N/A	0.429	0.054	N/A	N/A
BM-7	Dosing Bin #2	439,339.43	3,359,621.34	N/A	N/A	N/A	N/A	0.429	0.054	N/A	N/A
BM-9	Lime Handling Under Kilns	439,321.61	3,359,609.08	N/A	N/A	N/A	N/A	0.857	0.108	N/A	N/A
BM-10	Lime Belt Transfer to Reject	439,312.05	3,359,610.91	N/A	N/A	N/A	N/A	0.257	0.032	N/A	N/A
BM-11	Lime Crusher Bldg	439,398.32	3,359,657.04	N/A	N/A	N/A	N/A	0.300	0.038	N/A	N/A
BM-12	Top of Lime Silos / Screening	439,389.96	3,359,654.42	N/A	N/A	N/A	N/A	0.557	0.070	N/A	N/A
BM-13	Lime Silo Truck Loadout Spouts	439,391.37	3,359,635.82	N/A	N/A	N/A	N/A	0.064	0.008	N/A	N/A
BM-14	Lime Silo Truck Loadout Spouts	439,389.41	3,359,644.80	N/A	N/A	N/A	N/A	0.064	0.008	N/A	N/A
BM-15	Lime Silo Truck Loadout Spouts	439,387.44	3,359,653.78	N/A	N/A	N/A	N/A	0.064	0.008	N/A	N/A
BM-16	Lime Silo Truck Loadout Spouts	439,385.48	3,359,662.76	N/A	N/A	N/A	N/A	0.064	0.008	N/A	N/A
BM-17	Reject Bin Top	439,303.09	3,359,603.04	N/A	N/A	N/A	N/A	0.300	0.038	N/A	N/A
BM-19	Kiln Stack	439,339.19	3,359,613.08	41.25	5.20	21.64	2.73	5.000	0.630	49.5	6.24
BM-21	Lime Reject Bin Loadout	439,305.66	3,359,603.63	N/A	N/A	N/A	N/A	0.129	0.016	N/A	N/A
BM-23	Stone Feed Reject Bin Loadout	439,336.93	3,359,591.23	N/A	N/A	N/A	N/A	0.129	0.016	N/A	N/A
BM-24	Kiln 1 Skip Car Loading	439,329.32	3,359,596.69	N/A	N/A	N/A	N/A	0.429	0.054	N/A	N/A
BM-25	Kiln 2 Skip Car Loading	439,344.55	3,359,596.70	N/A	N/A	N/A	N/A	0.429	0.054	N/A	N/A
BM-27	Coke Conveyor Belt Transfer	439,343.23	3,359,679.73	N/A	N/A	N/A	N/A	0.300	0.038	N/A	N/A
BM-28	Coke Raw Storage Bin	439,334.93	3,359,677.17	N/A	N/A	N/A	N/A	0.214	0.027	N/A	N/A
BM-30	Coke Process Dust Collector Stack	439,348.26	3,359,648.84	0.3200	0.0404	0.0051	0.0006	0.943	0.119	0.1362	0.0172
BM-31	Lime Railcar Loadout	439,377.14	3,359,627.39	N/A	N/A	N/A	N/A	0.129	0.016	N/A	N/A

Note: NOx = Nitrogen Oxides; SO2 = Sulfur Dioxide; CO = Carbon Monoxide
PM_{10} = Particulate Matter Less Than 10 Microns; $PM_{2.5}$ = Particulate Matter Less Than 2.5 Microns
lb/hr = pounds per hour; g/s = grams per second
$PM_{2.5}$ is assumed to be 50% of PM_{10} for all sources except the kiln stack where $PM_{2.5}$ is equal to PM_{10}.
N/A = Not Applicable

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table C-7. Stack Parameters of Jacksonville Lime Sources

EU_ID	Description	Height		Exit Temperature		Exit Velocity		Exit Diameter	
		ft	meter	°F	K	ft/s	m/s	ft	meters
KILN1	Vertical Kiln No. 1	213.2	65.00	284	413.2	55.4	16.9	3.0	0.91
	Natural Gas	213.2	65.00	284	413.2	55.4	16.9	3.0	0.91
KILN2	Vertical Kiln No. 2	213.2	65.00	284	413.2	55.4	16.9	3.0	0.91
	Natural Gas	213.2	65.00	284	413.2	55.4	16.9	3.0	0.91
BM-3	Wood Chip Raw Storage Collector	63.0	19.2	70	294.1	66.1	20.2	0.9	0.27
BM-4	Wood Chip Process Dust Collector Stack	57.0	17.4	150	338.6	63.3	19.3	1.8	0.54
BM-6	Dosing Bin #1	74.0	22.6	150	338.6	64.0	19.5	1.4	0.42
BM-7	Dosing Bin #2	74.0	22.6	70	294.1	66.7	20.3	1.3	0.38
BM-9	Lime Handling Under Kilns	35.0	10.7	150	338.6	64.0	19.5	2.0	0.60
BM-10	Lime Belt Transfer to Reject	47.0	14.3	150	338.6	69.4	21.1	1.0	0.31
BM-11	Lime Crusher Bldg	37.0	11.3	150	338.6	67.2	20.5	1.1	0.34
BM-12	Top of Lime Silos / Screening	97.0	29.6	70	294.1	69.4	21.2	1.4	0.43
BM-13	Lime Silo Truck Loadout Spouts	22.0	6.7	70	294.1	65.8	20.1	0.7	0.21
BM-14	Lime Silo Truck Loadout Spouts	22.0	6.7	70	294.1	65.8	20.1	0.7	0.21
BM-15	Lime Silo Truck Loadout Spouts	22.0	6.7	70	294.1	65.8	20.1	0.7	0.21
BM-16	Lime Silo Truck Loadout Spouts	22.0	6.7	70	294.1	65.8	20.1	0.7	0.21
BM-17	Reject Bin Top	85.0	25.9	150	338.6	67.2	20.5	1.1	0.34
BM-19	Kiln Stack	213.3	65.0	294	418.6	65.6	20.0	4.8	1.46
BM-21	Lime Reject Bin Loadout	22.0	6.7	70	294.1	65.8	20.1	0.7	0.21
BM-23	Stone Feed Reject Bin Loadout	22.0	6.7	70	294.1	65.8	20.1	0.7	0.21
BM-24	Kiln 1 Skip Car Loading	42.0	12.8	70	294.1	66.7	20.3	1.3	0.38
BM-25	Kiln 2 Skip Car Loading	42.0	12.8	70	294.1	66.7	20.3	1.3	0.38
BM-27	Coke Conveyor Belt Transfer	22.0	6.7	70	294.1	70.3	21.4	1.0	0.31
BM-28	Coke Raw Storage Bin	63.0	19.2	70	294.1	66.1	20.2	0.9	0.27
BM-30	Coke Process Dust Collector Stack	57.0	17.4	70	294.1	61.1	18.6	2.0	0.60
BM-31	Lime Railcar Loadout	34.0	10.4	70	294.1	65.8	20.1	0.7	0.21

Note: ft = feet; m = meter   F = Fahrenheit; K = Kelvin   ft/s = feet per second; m/s = meters per second

Sources: Jacksonville Lime, 2013.
ECT, 2013.

APPENDIX D

FDEP PERMIT APPLICATION FORMS

Department of
Environmental Protection

RECEIVED
AUG 29 2013
DIVISION OF AIR
RESOURCE MANAGEMENT

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 any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **Jacksonville Lime, LLC**
2. Site Name:
3. Facility Identification Number: 0310583
4. Facility Location...
   Street Address or Other Locator: **1915 Wigmore Street**
   City: Jacksonville County: **Duval** Zip Code: **32206**
5. Relocatable Facility? ☐ Yes ☒ **No**
6. Existing Title V Permitted Facility? ☐ Yes ☒ **No**

Application Contact

1. Application Contact Name: **Bill Harris / Jackie Padgett**
2. Application Contact Mailing Address...**1915 Wigmore Street**
   Organization/Firm: **Jacksonville Lime, LLC**
   Street Address: **1915 Wigmore Street**
   City: **Jacksonville** State: **Florida** Zip Code: **32206**
3. Application Contact Telephone Numbers...
   Telephone: **(404) - 626 2990 (205) – 664 7129**
4. Application Contact E-mail Address:
   wharrisco@aol.com; **Jackie.Padgett@carmeusena.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 8-29-13	3. PSD Number (if applicable):
2. Project Number(s): 0310583-001-AC-PSD	4. Siting Number (if applicable):

426

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being submitted to obtain: (Check one)

Air Construction Permit

☒ Air construction permit.

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

☐ Initial Title V air operation permit.

☐ Title V air operation permit revision.

☐ Title V air operation permit renewal.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

☐ Air construction permit and Title V permit revision, incorporating the proposed project.

☐ Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

☐ I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
KILN1	Lime Kiln 1	AC1A	NA
KILN2	Lime Kiln 2	AC1A	NA
FD-1	Fuel Dryer	AC1A	NA
BM-3	Wood Chip Raw Storage	AC1A	NA
BM-4	Wood Chip Processing	AC1A	NA
BM-6	Coke Transfer to Kiln 1	AC1A	NA
BM-7	Coke Transfer to Kiln 2	AC1A	NA
BM-9	Lime Handling Under Kilns	AC1A	NA
BM-10	Lime Belt Transfer to Reject	AC1A	NA

Application Processing Fee

Check one: ☐ Attached - Amount: $_______________ ☐ Not Applicable

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
BM-11	Lime Crushing / Processing Building	AC1A	NA
BM-12	Lime Transfer / Top of Lime Silos / Screening	AC1A	NA
BM-13	Lime Loadout Silo 1	AC1A	NA

APPLICATION INFORMATION

BM-14	Lime Loadout Silo 2	AC1A	NA
BM-15	Lime Loadout Silo 3	AC1A	NA
BM-16	Lime Loadout Silo 4	AC1A	NA
BM-17	Reject Lime Bin	AC1A	NA
BM-19	Baghouse for Kiln 1	AC1A	NA
	Baghouse for Kiln 2	AC1A	NA
BM-21	Truck Loadout for Reject Lime	AC1A	NA
BM-23	Stone Feed Reject Bin Loadout	ACIA	NA
BM-24	Kiln 1 Skip Car Loading	ACIA	NA
BM-25	Kiln 2 Skip Car Loading	ACIA	NA
BM-27	Coke Conveyor Belt Transfer	ACIA	NA
BM-28	Coke Raw Storage Bin	ACIA	NA
BM-30	Coke Processing	ACIA	NA
BM-31	Lime Railcar Loadout	ACIA	NA
	Total Air Permit Processing Fee		$7,500

Application Processing Fee

Check one: ☒ Attached - Amount: $ 7,500 ☐ Not Applicable

Application processing fee of $7,500 is required pursuant to Rule 62-4.050(4)(a)1., F.A.C.

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   Nick Caggiano
2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **Jacksonville Lime, LLC**
   Street Address: **P.O. Box 37**
   City: **Saginaw** State: **AL** Zip Code: **35137**
3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(412) 225 - 3148**
4. Owner/Authorized Representative E-mail Address: nick.caggiano@carmeusena.com
5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.

   Signature

   8/23/13
   Date

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:
Nick Caggiano

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):

☒ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.

☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively.

☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.

☐ The designated representative at an Acid Rain source, CAIR source, or Hg Budget source.

3. Application Responsible Official Mailing Address...
Organization/Firm: **Jacksonville, Lime, LLC**
Street Address: **P.O. Box 37**
City: **Saginaw** State: **AL** Zip Code: **35137**

4. Application Responsible Official Telephone Numbers...
Telephone: **(412) 225 - 3148**

5. Application Responsible Official E-mail Address: **nick.caggiano@carmeusena.com**

6. Application Responsible Official Certification:

I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

Signature

8/23/13
Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: **Thomas W. Davis**
Registration Number: **36777**

2. Professional Engineer Mailing Address...
Organization/Firm: **Environmental Consulting & Technology, Inc.**
Street Address: **3701 NW 98th Street**
City: **Gainesville** State: **Florida** Zip Code: **32606**

3. Professional Engineer Telephone Numbers...
Telephone: **(352) 332 – 0444 ext 16109** Fax:**(352) 332 - 6722**

4. Professional Engineer E-mail Address: **tdavis@ectinc.com**

5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here , if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

No. 36777

Signature

8/27/13
Date

(seal)

* Attach any exception to certification statement.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone **17** East (km) **439.330** North (km) **3,359.622**		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) **30°22'01"** Longitude (DD/MM/SS) **81°37'53"**	
3. Governmental Facility Code: **0**	4. Facility Status Code: **C**	5. Facility Major Group SIC Code: **32**	6. Facility SIC(s): **3274**
7. Facility Comment :			

Facility Contact

1. Facility Contact Name:
Jackie Padgett

2. Facility Contact Mailing Address...
Organization/Firm: **Jacksonville Lime, LLC.**
Street Address: **P.O. Box 37**
City: **Saginaw** State: **AL** Zip Code: **35137-0037**

3. Facility Contact Telephone Numbers:
Telephone: **(205) 612-6770** ext. Fax: **(205) 664 - 7138**

4. Facility Contact E-mail Address: Jackie.padgett@carmeusena.com

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
Same as in Section I.

2. Facility Primary Responsible Official Mailing Address...
Organization/Firm:
Street Address:
City: State: Zip Code:

3. Facility Primary Responsible Official Telephone Numbers...
Telephone: ( ) - ext. Fax: ( ) -

4. Facility Primary Responsible Official E-mail Address:

FACILITY INFORMATION

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source ☐ Unknown
2. ☐ Synthetic Non-Title V Source
3. ☒ Title V Source
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs
6. ☐ Major Source of Hazardous Air Pollutants (HAPs)
7. ☐ Synthetic Minor Source of HAPs
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)
10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))
12. Facility Regulatory Classifications Comment:

NSPS Subpart OOO – Nonmetallic Mineral Processing Plants

NESHAP Subpart AAAAA – Lime Manufacturing Plants

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
NOX	**A**	**N**
SO2	**A**	**N**
PM	**B**	**N**
PM10	**B**	**N**
PM2.5	**B**	**N**
CO	**A**	**N**
VOC	**B**	**N**
H106 (hydrogen chloride)	**A**	**N**
SAM	**B**	**N**
H114 (mercury)	**B**	**N**
HAPS (total)	**A**	**N**
GHG	**A**	**N**
PB	**B**	**N**

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps – **Not Applicable**

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **Section 2.0** Previously Submitted, Date:______________

2. Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **Section 2.0** Previously Submitted, Date:______________

3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **Section 4.0** ☐ Previously Submitted, Date:__________

Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location:
☒ Attached, Document ID: **Section 2.0** Not Applicable (existing permitted facility)

2. Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL):
☒ Attached, Document ID: **Section 2.0**

3. Rule Applicability Analysis:
☒ Attached, Document ID: **Section 3.0**

4. List of Exempt Emissions Units:
☐ Attached, Document ID:__________ ☒ Not Applicable (no exempt units at facility)

5. Fugitive Emissions Identification:
☒ Attached, Document ID: **Section 2.0** ☐ Not Applicable

6. Air Quality Analysis (Rule 62-212.400(7), F.A.C.):
☒ Attached, Document ID: **Section 6.0** ☐ Not Applicable

7. Source Impact Analysis (Rule 62-212.400(5), F.A.C.):
☒ Attached, Document ID: **Section 6.0** ☐ Not Applicable

8. Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.):
☒ Attached, Document ID: **Section 6.0** ☐ Not Applicable

9. Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.):
☒ Attached, Document ID: **Section 8.0** ☐ Not Applicable

10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.):
☐ Attached, Document ID:__________ ☒ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications Not Applicable

1. List of Exempt Emissions Units:
   ☐ Attached, Document ID:__________ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications Not Applicable

1. List of Insignificant Activities: (Required for initial/renewal applications only)
   ☐ Attached, Document ID:__________ ☐ Not Applicable (revision application)

2. Identification of Applicable Requirements: (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought)
   ☐ Attached, Document ID:__________
   ☐ Not Applicable (revision application with no change in applicable requirements)

3. Compliance Report and Plan: (Required for all initial/revision/renewal applications)
   ☐ Attached, Document ID:__________
   Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.

4. List of Equipment/Activities Regulated under Title VI: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:__________
   ☐ Equipment/Activities Onsite but Not Required to be Individually Listed
   ☐ Not Applicable

5. Verification of Risk Management Plan Submission to EPA: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:__________ ☐ Not Applicable

6. Requested Changes to Current Title V Air Operation Permit:
   ☐ Attached, Document ID:__________ ☐ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1. Acid Rain Program Forms:

Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)):
☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
☒ Not Applicable (not an Acid Rain source)

Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.):
☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
☒ Not Applicable

New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.):
☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
☒ Not Applicable

2. CAIR Part (DEP Form No. 62-210.900(1)(b)):
☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
☒ Not Applicable (not a CAIR source)

3. Hg Budget Part (DEP Form No. 62-210.900(1)(c)):
☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
☒ Not Applicable (not a Hg Budget unit)

Additional Requirements Comment

EMISSIONS UNIT INFORMATION
Section [1] of [8]

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
Two identical parallel flow regenerative lime kilns. The information presented in the following sections is for each unit.

3. Emissions Unit Identification Number: **KILN1 and KILN2**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: October **2013**	6. Initial Startup Date: December **2014**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)
   ☐ Acid Rain Unit
   ☐ CAIR Unit
   ☐ Hg Budget Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

EMISSIONS UNIT INFORMATION
Section [1] of [8]

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description:
Fabric filter baghouse – high temperature design

2. Control Device or Method Code: **016**

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **792 tons per day (tpd) of stone feed (maximum)**

2. Maximum Production Rate: **396 tpd of lime produced (maximum)**

3. Maximum Heat Input Rate: **52.48 million Btu/hr (based on pet coke)**

4. Maximum Incineration Rate: pounds/hr
tons/day

5. Requested Maximum Operating Schedule:
24 hours/day **7** days/week
52 weeks/year **8,760** 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: **BM-19**

2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Exhaust stack exit baghouses serving lime kilns.**

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **KILN1 (EU BM-19), and KILN2 (EU BM-19)**

5. Discharge Type Code: **V**

6. Stack Height: **213.2** feet

7. Exit Diameter: **4.78** feet

8. Exit Temperature: **294** °F

9. Actual Volumetric Flow Rate: **70,612** acfm (nominal)
acfm (max.)

10. Water Vapor: **10** %

11. Maximum Dry Standard Flow Rate: **49,448** dscfm

12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates...
Zone: East (km):
North (km):

14. Emission Point Latitude/Longitude...
Latitude (DD/MM/SS)
Longitude (DD/MM/SS)

15. Emission Point Comment:

KILN1 & 2 UTM 439.33919 km East, 3,359.61308 km North, Zone 17

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment **1**_ of **6**_

1. Segment Description (Process/Fuel Type): **Limestone (worst case dolomitic lime at 54% $CaCO_3$ and 46% $MgCO_3$)**		
2. Source Classification Code (SCC): **30501603**	3. SCC Units: **tons**	
4. Maximum Hourly Rate: **33 tons per hour**	5. Maximum Annual Rate: **289,080 tons per year**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **NA**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **NA**
10. Segment Comment:		

Segment Description and Rate: Segment **2**_ of **6**_

1. Segment Description (Process/Fuel Type): **Lignite**		
2. Source Classification Code (SCC): **30501603**	3. SCC Units: **tons**	
4. Maximum Hourly Rate: **4.1 tons per hour**	5. Maximum Annual Rate: **35,916 tons per year**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **3.6**
10. Segment Comment:		

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

Segment Description and Rate: Segment 3_ of 6_

1. Segment Description (Process/Fuel Type): **Coal**		
2. Source Classification Code (SCC): **30501603**	3. SCC Units: **tons**	
4. Maximum Hourly Rate: **2.3** tons per hour	5. Maximum Annual Rate: **20,148 tons per year**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **6.2 (bituminous)**
10. Segment Comment:		

Segment Description and Rate: Segment **4**_ of **6**_

1. Segment Description (Process/Fuel Type): **Coke**		
2. Source Classification Code (SCC): **30501603**	3. SCC Units: **tons**	
4. Maximum Hourly Rate: **2.2 tons per hour**	5. Maximum Annual Rate: **19,272 tons per year**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **5.2**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **6.2**
10. Segment Comment:		

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

Segment Description and Rate: Segment 5_ of 6_

1. Segment Description (Process/Fuel Type):
Natural Gas

2. Source Classification Code (SCC):
30501623

3. SCC Units:
MMcf

4. Maximum Hourly Rate:
56,592 cf/hour

5. Maximum Annual Rate:
495.7 MMcf/year

6. Estimated Annual Activity Factor:

7. Maximum % Sulfur:

8. Maximum % Ash:

9. Million Btu per SCC Unit:
1,020 x 10^6

10. Segment Comment:

Segment Description and Rate: Segment _6_ of _6_

1. Segment Description (Process/Fuel Type):
Wood Chips

2. Source Classification Code (SCC):
3-99-999-99

3. SCC Units:
tons

4. Maximum Hourly Rate:
3.1 tons per hour

5. Maximum Annual Rate:
27,156 tons per year

6. Estimated Annual Activity Factor:

7. Maximum % Sulfur:

8. Maximum % Ash:

9. Million Btu per SCC Unit:
4.4

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
NOX			EL
SO2			EL
PM	016		EL
PM10	016		EL
PM2.5	016		EL
CO			EL
VOC			EL
H106 (HCl)			EL
SAM			EL
H114 (Hg)			EL
GHG			EL
PB			EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOX**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **41.3 lb/hour** **171.65 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor:

7. Emissions Method Code: **5**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Engineering estimate based on kiln design and emissions from similar kilns.

See Appendix C emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **41.3 lb/hour 171.65 tons/year**
5. Method of Compliance: **Method 7 or 7E**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **21.64 lb/hour** **95.1 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor:	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Engineering estimate based on kiln design and emissions from similar kilns.

See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **21.64 lb/hour** **95.1 tons/year**
5. Method of Compliance: **Fuel sulfur content, and monitoring and recordkeeping.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.5 lb/hour** **11.0 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor:	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Filterable PM based on 0.01 gr/dscf. Condensable PM based on emissions test conducted by Carmeuse.

See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.1 lb/ton of stone feed**	4. Equivalent Allowable Emissions: **2.5 lb/hour 11.0 tons/year**
5. Method of Compliance: **Method 201/201A, 202, continuous parameter monitoring system**	
6. Allowable Emissions Comment (Description of Operating Method): **40 CFR 63 Subpart AAAAA** **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **5.0 lb/hour** **20.8 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor:	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Filterable PM based on 0.01 gr/dscf. Condensable PM based on emissions test conducted by Carmeuse.

See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **5.0 lb/hour** **20.8 tons/year**
5. Method of Compliance: **Method 201/201A, 202, continuous parameter monitoring system**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **5.0 lb/hour** **20.8 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor:	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Filterable PM based on 0.01 gr/dscf. Condensable PM based on emissions test conducted by Carmeuse.

See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **5.0 lb/hour** **20.8 tons/year**
5. Method of Compliance: **Method 201/201A, 202, continuous parameter monitoring system**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **49.5 lb/hour** **206.0 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor:	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **Engineering estimate based on kiln design and emissions from similar kilns.** **See Appendix C for emission calculations.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **49.5 lb/hour** **206.0 tons/year**
5. Method of Compliance: **Method 10**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.3 lb/hour** **9.6 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **Vendor guarantee of 25 mg/Nm^3.**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix C for emission calculations.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions __ of __ **Not Applicable**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H106 (hydrogen chloride)**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.6 lb/hour** **10.8 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor:	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix C for emission calculations.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **2.6 lb/hour 10.8 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed MACT – Rule 62-212.800(11)(d)2., F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SAM**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **0.2 lb/hour** **0.80 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: SO2 emission rate x 0.74/100 x 98/80

7. Emissions Method Code: **5**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions __ of __ **Not Applicable**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted:
H114 (Mercury)

2. Total Percent Efficiency of Control:

3. Potential Emissions:
0.0002 lb/hour **0.0008 tons/year**

4. Synthetically Limited?
☐ Yes ☒ No

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

6. Emission Factor:

7. Emissions Method Code:
3

8.a. Baseline Actual Emissions (if required):
tons/year

8.b. Baseline 24-month Period:
From: To:

9.a. Projected Actual Emissions (if required):
tons/year

9.b. Projected Monitoring Period:
☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions __ of __ **Not Applicable**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **GHG (measured as CO_2e)**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **42,900 lb/hour 178,507 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **Reference: 40 CFR Part 98 Subparts C and S.**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for GHG emission calculations.**

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **42,900 lb/hour 178,507 tons/year**
5. Method of Compliance: **Production and fuel monitoring, and recordkeeping.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PB**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **0.001 lb/hour** **0.004 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor:

7. Emissions Method Code: **3**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1 **Not Applicable**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation _1_ of 1_

1. Visible Emissions Subtype: **VE10**
2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity:
   Normal Conditions: **10** % Exceptional Conditions: %
   Maximum Period of Excess Opacity Allowed: min/hour
4. Method of Compliance: **EPA Method 5**
5. Visible Emissions Comment:

Rule 62-296.709(2), F.A.C.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:
2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity:
   Normal Conditions: % Exceptional Conditions: %
   Maximum Period of Excess Opacity Allowed: min/hour
4. Method of Compliance:
5. Visible Emissions Comment:

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code:	2. Pollutant(s): PM (filterable)
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:

7. **Continuous Monitor Comment: Per 40 CFR 63 Subpart AAAAA is subject to 0.10 lb of PM per ton of stone feed. Compliance to be determined by operation of a continuous parameter monitoring system.**

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:

7. Continuous Monitor Comment:

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **Section 2.0** ☐ Previously Submitted, Date ______

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **Section 2.0** ☐ Previously Submitted, Date ______

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **Section 4.0** ☐ Previously Submitted, Date ______

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: ______
Test Date(s)/Pollutant(s) Tested: ______
☐ Previously Submitted, Date: ______
Test Date(s)/Pollutant(s) Tested: ______
☐ To be Submitted, Date (if known): ______
Test Date(s)/Pollutant(s) Tested: ______
☒ Not Applicable
Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☐ Attached, Document ID: ______ ☒ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
   ☒ Attached, Document ID: **Section 4.0** ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
   ☒ Attached, Document ID: **Section 5.0** ☐ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
   ☐ Attached, Document ID: ___________ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
   ☐ Attached, Document ID: ___________
2. Compliance Assurance Monitoring:
   ☐ Attached, Document ID: __________ ☐ Not Applicable
3. Alternative Methods of Operation:
   ☐ Attached, Document ID: __________ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading):
   ☐ Attached, Document ID: __________ ☐ Not Applicable

Additional Requirements Comment

EMISSIONS UNIT INFORMATION
Section [2] of [8]

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: **Wood chip storage, processing and transfer**

3. Emissions Unit Identification Number: **BM-3, BM-4, BM-6**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **NA**	6. Initial Startup Date: **NA**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit
☐ CAIR Unit
☐ Hg Budget Unit

9. Package Unit: **N/A**
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control __ of **NOT APPLICABLE**

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:
2. Control Device or Method Code:

EMISSIONS UNIT INFORMATION
Section [2] of [8]

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:			
2. Maximum Production Rate:			
3. Maximum Heat Input Rate:			
4. Maximum Incineration Rate:	pounds/hr 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: **BM-3, BM-4, BM-6**	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:
Emission points BM-3 and BM-6 are released horizontally at 63 and 74 ft, respectively.

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

5. Discharge Type Code: **V (BM-4)**	6. Stack Height: **57** feet	7. Exit Diameter: **1.8** feet
8. Exit Temperature: **150°F**	9.Actual Volumetric Flow Rate: **9500** acfm	10. Water Vapor: **0** %

11. Maximum Dry Standard Flow Rate: **8,252** dscfm	12. Nonstack Emission Point Height: **N/A** feet
13. Emission Point UTM Coordinates... Zone: East (km): **N/A** North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) **N/A** Longitude (DD/MM/SS)

15. Emission Point Comment:
BM-3 East UTM = 439.321 km, and North UTM = 3,359.679 km, zone 17
BM-4 East UTM = 439.335 km, and North UTM = 3,359.645 km, zone 17
BM-6 East UTM = 439.334 km, and North UTM = 3,359.621 km, zone 17

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1_ of 1_

1. Segment Description (Process/Fuel Type): **Wood processing, handling and storage**		
2. Source Classification Code (SCC): **20100202**	3. SCC Units: Tons Processed	
4. Maximum Hourly Rate: **3.1 tons per hour**	5. Maximum Annual Rate: **13.58 tpy**	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: **All segment information provided above is for one dust collector.**		

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:		

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/PM10	**018**		**EL**
PM2.5	**018**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.7 lb/hour** **11.82 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **N/A**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix C for emission calculations.** **All emissions provided above are for one dust collector.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.01gr/dscfm**	4. Equivalent Allowable Emissions: **2.7 lb/hour 11.82 tons/year**
5. Method of Compliance: Monitoring of baghouse.	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **2.7 lb/hour** **11.82 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **N/A**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.
All emissions provided above are for one dust collector.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **2.7 lb/hour 11.82 tons/year**
5. Method of Compliance: Monitoring of baghouse.	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.** **40 CFR 60 Subpart JJJJ**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment: **Rule 62-296.320(4)(b), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of Not Applicable

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ☐ Previously Submitted, Date ________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ________ ☐ Previously Submitted, Date ________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ________ ☐ Previously Submitted, Date ________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ________ ☐ Previously Submitted, Date ________
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ________ ☐ Previously Submitted, Date ________
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: ________
Test Date(s)/Pollutant(s) Tested: ________

☐ Previously Submitted, Date: ________
Test Date(s)/Pollutant(s) Tested: ________

☐ To be Submitted, Date (if known):________
Test Date(s)/Pollutant(s) Tested: ________

☒ Not Applicable

Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☐ Attached, Document ID: ________ ☒ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
   ☐ Attached, Document ID: ___________ ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
   ☐ Attached, Document ID: ___________ ☐ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
   ☐ Attached, Document ID: ___________ ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
   ☐ Attached, Document ID: ___________
2. Compliance Assurance Monitoring:
   ☐ Attached, Document ID: __________ ☐ Not Applicable
3. Alternative Methods of Operation:
   ☐ Attached, Document ID: __________ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading):
   ☐ Attached, Document ID: __________ ☐ Not Applicable

Additional Requirements Comment

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification Not Applicable

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: **Coke Processing with fuel dryer**

3. Emissions Unit Identification Number: **BM-30**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **NA**	6. Initial Startup Date: **NA**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

☐ Hg Budget Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

EMISSIONS UNIT INFORMATION
Section [3] of [8]

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:
2. Maximum Production Rate:
3. Maximum Heat Input Rate: **3.5 million Btu/hr**
4. Maximum Incineration Rate: pounds/hr
   tons/day
5. Requested Maximum Operating Schedule:
   24 hours/day **7** days/week
   52 weeks/year **8,760** 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: **BM-30**

2. Emission Point Type Code: **1**

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

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

5. Discharge Type Code: **V**

6. Stack Height: Feet **57.0**

7. Exit Diameter: Feet **2.0**

8. Exit Temperature: **TBD**

9. Actual Volumetric Flow Rate: **11,000** acfm

10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm

12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates...
Zone: 17 East (km): 439.348
North (km): 3,359.649

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): **Natural gas**		
2. Source Classification Code (SCC): **10200603**	3. SCC Units: **Million cubic feet**	
4. Maximum Hourly Rate: **3,405 cf/hr**	5. Maximum Annual Rate: **29.8 MMcf per year**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: NA	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **1,028**
10. Segment Comment:		

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:		

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
NOX			**EL**
CO			**EL**
VOC			**EL**
SO2			**EL**
PM/PM10/ PM2.5			**EL**
GHG			**EL**
PB			**EL**
HAP			**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOX**

2. Total Percent Efficiency of Control:

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

6. Emission Factor: **94.0 lb/MMscf**

7. Emissions Method Code: **3**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **0.32 lb/hour** **1.4 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **0.14 lb/hour** **0.6 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **40.0 lb/MMscf**

7. Emissions Method Code: **3**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **0.14 lb/hour** **0.6 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.87E-02 lb/hour 8.20E-02 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **5.5 lb/MMscf**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix C for emission calculations.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **1.87E-02 lb/hour 8.20E-02 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SO2**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **5.11E-03 lb/hour 2.24E-02 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **1.5 lb/MMscf**

7. Emissions Method Code: **3**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **5.11E-03 lb/hour 2.24E-02 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10/PM2.5**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.59E-02 lb/hour 1.13E-01 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **7.6 lb/MMscf**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix C for emission calculations.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions __1 of __1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **2.59E-02 lb/hour 1.13E-01 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **GHG (measured as CO_2e)**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **409.4 lb/hour** **1,794 tons/year**	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix C for emission factors used.** **Reference: 40 CFR Part 98 Subpart C.**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for GHG emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

EMISSIONS UNIT INFORMATION **POLLUTANT DETAIL INFORMATION**
Section [3] of [8] Page **[12] of [16]**

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **409.4 lb/hour 1,794 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PB**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **1.7E-06 lb/hour 7.46E-06 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **5.00E-04 lb/MMscf**

7. Emissions Method Code: **3**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **1.7E-06 lb/hour** **7.46E-06 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **HAP**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **6.43E-03 lb/hour 2.82E-02 tons/year**

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **See Appendix C for emission factors used.**

7. Emissions Method Code: **3**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **6.43E-03 lb/hour 2.82E-02 tons/year**
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: 20% Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance: **EPA Method 9**

5. Visible Emissions Comment:

Rule 62-296.320(4)(b), F.A.C.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:

5. Visible Emissions Comment:

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___ **Not Applicable**

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: Appendix E ☐ Previously Submitted, Date__________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: __________
Test Date(s)/Pollutant(s) Tested: ____________________
☐ Previously Submitted, Date: ________
Test Date(s)/Pollutant(s) Tested: ____________________
☐ To be Submitted, Date (if known):__________
Test Date(s)/Pollutant(s) Tested: ____________________
☒ Not Applicable
Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☐ Attached, Document ID: __________ ☒ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
   ☐ Attached, Document ID: ______ ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
   ☐ Attached, Document ID: ______ ☐ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
   ☐ Attached, Document ID: ______ ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
   ☐ Attached, Document ID: ______
2. Compliance Assurance Monitoring:
   ☐ Attached, Document ID: ______ ☐ Not Applicable
3. Alternative Methods of Operation:
   ☐ Attached, Document ID: ______ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading):
   ☐ Attached, Document ID: ______ ☐ Not Applicable

Additional Requirements Comment

EMISSIONS UNIT INFORMATION
Section [4] of [8]

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: **Two identical dust collectors for limestone transfer operations to each kiln. All data presented are for one dust collector.**

3. Emissions Unit Identification Number: **BM-24, BM-25**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **NA**	6. Initial Startup Date: **NA**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

☐ Hg Budget Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description:
Fabric filter

2. Control Device or Method Code: **018**

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:
2. Maximum Production Rate:
3. Maximum Heat Input Rate:
4. Maximum Incineration Rate: pounds/hr
   tons/day
5. Requested Maximum Operating Schedule:
   24 hours/day **7** days/week
   52 weeks/year **8,760** 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: **BM-24 & BM-25**	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: **H**	6. Stack Height: **55** feet	7. Exit Diameter: **15" x 12"** feet
8. Exit Temperature: **70** deg F	9. Actual Volumetric Flow Rate: **5,000** acfm acfm	10. Water Vapor: **0** %

11. Maximum Dry Standard Flow Rate: **5,000** dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

BM-24 East UTM = 439.329 km, and North UTM = 3,359.597 km, zone 17

BM-25 East UTM = 439.345 km, and North UTM = 3,359.697 km, zone 17

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1_ of 1_

1. Segment Description (Process/Fuel Type): **Processed stone handling**		
2. Source Classification Code (SCC): **30501607**	3. SCC Units: **Tons processed**	
4. Maximum Hourly Rate: **59.0** tons per hour	5. Maximum Annual Rate: **515,088** tpy	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: **All segment information provided above is for one dust collector.**		

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:		

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/PM10	**018**		**EL**
PM2.5	**018**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **0.429** lb/hour **1.88** tons/year

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **N/A**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.
All emissions provided above are for one dust collector.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions __1 of __1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: **0.21** lb/hour **0.94** tons/year
5. Method of Compliance: **Monitoring of baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.** **40 CFR 60 Subpart OOO, 40 CFR Subpart AAAAA**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.21** lb/hour **0.94** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **N/A**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
See Appendix C for emission calculations.
All emissions provided above are for one dust collector.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **0.21** lb/hour **0.94** tons/year
5. Method of Compliance: **Monitoring of baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE07**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: 7 % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:
EPA Reference Method 9

5. Visible Emissions Comment:

40 CFR 60 Subpart OOO
40 CFR 63 Subpart AAAAA

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:

5. Visible Emissions Comment:

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___ **Not Applicable**

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ☐ Previously Submitted, Date __________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ________ ☐ Previously Submitted, Date ________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ________ ☐ Previously Submitted, Date ________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ________ ☐ Previously Submitted, Date ________
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ________ ☐ Previously Submitted, Date ________
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: ________
Test Date(s)/Pollutant(s) Tested: ____________________
☐ Previously Submitted, Date: ______
Test Date(s)/Pollutant(s) Tested: ____________________
☐ To be Submitted, Date (if known):________
Test Date(s)/Pollutant(s) Tested: ____________________
☒ Not Applicable
Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☐ Attached, Document ID: ________ ☒ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
   ☐ Attached, Document ID: ________ ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
   ☐ Attached, Document ID: ________ ☐ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
   ☐ Attached, Document ID: ________ ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
   ☐ Attached, Document ID: ________
2. Compliance Assurance Monitoring:
   ☐ Attached, Document ID: ________ ☐ Not Applicable
3. Alternative Methods of Operation:
   ☐ Attached, Document ID: ________ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading):
   ☐ Attached, Document ID: ________ ☐ Not Applicable

Additional Requirements Comment

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: **These sources are associated with the coke handling, storage, and transfer operations.**

3. Emissions Unit Identification Number: **BM-7,BM-27, BM-28**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **NA**	6. Initial Startup Date: **NA**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit
☐ CAIR Unit
☐ Hg Budget Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description:
Fabric filter

2. Control Device or Method Code: **018**

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:

2. Maximum Production Rate:

3. Maximum Heat Input Rate:

4. Maximum Incineration Rate: pounds/hr
tons/day

5. Requested Maximum Operating Schedule:
24 hours/day **7** days/week
52 weeks/year **8,760** 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: **BM-7, BM-27, BM-28**

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: **H**

6. Stack Height: feet

7. Exit Diameter: feet

8. Exit Temperature: deg F

9. Actual Volumetric Flow Rate: acfm
acfm

10. Water Vapor: **0 %**

11. Maximum Dry Standard Flow Rate: dscfm

12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates...
Zone: **17** East (km):
North (km):

14. Emission Point Latitude/Longitude...
Latitude (DD/MM/SS)
Longitude (DD/MM/SS)

15. Emission Point Comment:

BM-7: E UTM = 439.339 km, N UTM = 3,359.621 km, zone 17,
Ht = 74 ft, Dia = 1.3 ft, T = 70 ^{o}F, Flow Rates = 5,000 acfm and 5,000 dscfm
BM-27: E UTM = 439.343 km, N UTM = 3,359.680 km, zone 17,
Ht = 35 ft, Dia = 1.0 ft, T = 70 ^{o}F, Flow Rates = 3,500 acfm and 3,500 dscfm
BM-28 East UTM = 439.335 km, and North UTM = 3,359.677 km, zone 17,
Ht = 76 ft, Dia = 0.9 ft, T = 70 ^{o}F, Flow Rates = 2,500 acfm and 2,500 dscfm

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1_ of 1_

1. Segment Description (Process/Fuel Type): **Coke handling, storage, transfer and processing operations**		
2. Source Classification Code (SCC): **39000889**	3. SCC Units: **Tons processed**	
4. Maximum Hourly Rate: **2.2** tons per hour	5. Maximum Annual Rate: **19,272** tpy	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: **All segment information provided above is for one dust collector.**		

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:		

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/PM10	**018**		**EL**
PM2.5	**018**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**

2. Total Percent Efficiency of Control:

3. Potential Emissions: lb/hour tons/year

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **N/A**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for emission calculations.**
BM-7: Emissions of PM/PM10 = 0.43 lb/hour and 1.88 tons/year
BM-27: Emissions of PM/PM10 = 0.30 lb/hour and 0.22 tons/year
BM-28: Emissions of PM/PM10 = 0.21 lb/hour and 0.16 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Monitoring of Baghouse**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**

2. Total Percent Efficiency of Control:

3. Potential Emissions: lb/hour tons/year

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **N/A**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for emission calculations.**
BM-7: Emissions of PM/PM10 = 0.21 lb/hour and 0.94 tons/year
BM-27: Emissions of PM2.5 = 0.15 lb/hour and 0.11 tons/year
BM-28: Emissions of PM2.5 = 0.11 lb/hour and 0.08 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Monitoring of Baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Reference Method 9**	
5. Visible Emissions Comment: **Rule 62-296.320(4)(b), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:
2. Pollutant(s):
3. CMS Requirement: ☐ Rule ☐ Other
4. Monitor Information...
   Manufacturer:
   Model Number: Serial Number:
5. Installation Date:
6. Performance Specification Test Date:
7. Continuous Monitor Comment:

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:
2. Pollutant(s):
3. CMS Requirement: ☐ Rule ☐ Other
4. Monitor Information...
   Manufacturer:
   Model Number: Serial Number:
5. Installation Date:
6. Performance Specification Test Date:
7. Continuous Monitor Comment:

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ☐ Previously Submitted, Date ______________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _________ ☐ Previously Submitted, Date _________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _________ ☐ Previously Submitted, Date _________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _________ ☐ Previously Submitted, Date _________
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _________ ☐ Previously Submitted, Date _________
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _________
   Test Date(s)/Pollutant(s) Tested: ______________________________
   ____
   ☐ Previously Submitted, Date: ______
   Test Date(s)/Pollutant(s) Tested: ______________________________
   ____
   ☐ To be Submitted, Date (if known): _________
   Test Date(s)/Pollutant(s) Tested: ______________________________
   ____
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☐ Attached, Document ID: _________ ☒ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
   ☐ Attached, Document ID: ___________ ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
   ☐ Attached, Document ID: ___________ ☐ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
   ☐ Attached, Document ID: ___________ ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
   ☐ Attached, Document ID: ___________
2. Compliance Assurance Monitoring:
   ☐ Attached, Document ID: ___________ ☐ Not Applicable
3. Alternative Methods of Operation:
   ☐ Attached, Document ID: ___________ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading):
   ☐ Attached, Document ID: ___________ ☐ Not Applicable

Additional Requirements Comment

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: **These sources are associated with the lime handling, storage, and transfer operations.**

3. Emissions Unit Identification Number: **BM-9, BM-10, BM-11, BM-12, BM-17**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **NA**	6. Initial Startup Date: **NA**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit
☐ CAIR Unit
☐ Hg Budget Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description:
Fabric filter

2. Control Device or Method Code: **018**

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:

2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate:	pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	**24** hours/day **52** weeks/year	**7** days/week **8,760** 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: **BM-9, BM-10, BM-11, BM-12, BM-17**

2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:
BM-9: Ht = 35 ft, Dia = 2.0 ft, T = 150 °F, Flow Rates = 11,512 acfm and 10,000 dscfm
BM-10: Ht = 47 ft, Dia = 1.0 ft, T = 150 °F, Flow Rates = 3,454 acfm and 8,000 dscfm
BM-11: Ht = 37 ft, Dia = 1.1 ft, T = 150 °F, Flow Rates = 3,500 acfm and 3,454 dscfm
BM-12: Ht = 97 ft, Dia = 1.4 ft, T = 70 °F, Flow Rates = 6,500 acfm and 6,500 dscfm
BM-17: Ht = 85 ft, Dia = 1.1 ft, T = 150 °F, Flow Rates = 3,500 acfm and 4,029 dscfm

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

BM-9, -10, -11, and -17 release horizontally.

5. Discharge Type Code: **V (BM-12 only)**

6. Stack Height: Feet

7. Exit Diameter: feet

8. Exit Temperature: deg F

9. Actual Volumetric Flow Rate: acfm
acfm

10. Water Vapor: **0 %**

11. Maximum Dry Standard Flow Rate: dscfm

12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates...
Zone: **17** East (km):
North (km):

14. Emission Point Latitude/Longitude...
Latitude (DD/MM/SS)
Longitude (DD/MM/SS)

15. Emission Point Comment:
BM-9: UTMs = 439.322 km E, 3,359.609 km N, zone 17,

BM-10: East UTM = 439.312 km, and North UTM = 3,359.611 km, zone 17,

BM-11 East UTM = 439.398 km, and North UTM = 3,359.657 km, zone 17,

BM-12 East UTM = 439.390 km, and North UTM = 3,359.654 km, zone 17,

BM-17 East UTM = 439.303 km, and North UTM = 3,359.603 km, zone 17,

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment **1**_ of **1**_

1. Segment Description (Process/Fuel Type): **Lime handling, storage, and transfer operations**		
2. Source Classification Code (SCC): **30501605**	3. SCC Units: **Tons processed**	
4. Maximum Hourly Rate: **29.4** tons per hour	5. Maximum Annual Rate: **257,544** tpy	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:		

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:		

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/PM10	**018**		**EL**
PM2.5	**018**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **PM/PM10**

2. Total Percent Efficiency of Control:

3. Potential Emissions: lb/hour tons/year

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **N/A**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for emission calculations.**

BM-9: Emissions of PM/PM10 = 0.86 lb/hour and 3.75 tons/year
BM-10: Emissions of PM/PM10 = 0.26 lb/hour and 1.13 tons/year
BM-11: Emissions of PM/PM10 = 0.30 lb/hour and 1.31 tons/year
BM-12: Emissions of PM/PM10 = 0.56 lb/hour and 2.44 tons/year
BM-17: Emissions of PM/PM10 = 0.30 lb/hour and 0.33 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Monitoring of baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **N/A**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for emission calculations.**

BM-9: Emissions of PM/PM10 = 0.43 lb/hour and 1.88 tons/year
BM-10: Emissions of PM/PM10 = 0.13 lb/hour and 0.56 tons/year
BM-11: Emissions of PM/PM10 = 0.15 lb/hour and 0.66 tons/year
BM-12: Emissions of PM/PM10 = 0.28 lb/hour and 1.22 tons/year
BM-17: Emissions of PM/PM10 = 0.15 lb/hour and 0.16 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Monitoring of baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**

2. Basis for Allowable Opacity: ☒ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: **20** % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:
EPA Reference Method 9

5. Visible Emissions Comment:

Rule 62-296.320(4)(b), F.A.C.

Visible Emissions Limitation: Visible Emissions Limitation __ of ___

1. Visible Emissions Subtype:

2. Basis for Allowable Opacity: ☐ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:

5. Visible Emissions Comment:

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ☐ Previously Submitted, Date __________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: __________
Test Date(s)/Pollutant(s) Tested: __________

☐ Previously Submitted, Date: __________
Test Date(s)/Pollutant(s) Tested: __________

☐ To be Submitted, Date (if known): __________
Test Date(s)/Pollutant(s) Tested: __________

☒ Not Applicable

Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☐ Attached, Document ID: __________ ☒ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
☐ Attached, Document ID: ____________ ☐ Not Applicable

2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
☐ Attached, Document ID: ____________ ☐ Not Applicable

3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
☐ Attached, Document ID: ____________ ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
☐ Attached, Document ID: ____________

2. Compliance Assurance Monitoring:
☐ Attached, Document ID: ____________ ☐ Not Applicable

3. Alternative Methods of Operation:
☐ Attached, Document ID: ____________ ☐ Not Applicable

4. Alternative Modes of Operation (Emissions Trading):
☐ Attached, Document ID: ____________ ☐ Not Applicable

Additional Requirements Comment

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: **These sources are associated with the lime handling, screening, storage, and transfer operations.**

3. Emissions Unit Identification Number: **BM-13, BM-14, BM-15, BM-16, BM-21, BM-31**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **NA**	6. Initial Startup Date: **NA**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit
☐ CAIR Unit
☐ Hg Budget Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description:
Fabric filter

2. Control Device or Method Code: **018**

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:

2. Maximum Production Rate:

3. Maximum Heat Input Rate:

4. Maximum Incineration Rate: pounds/hr
tons/day

5. Requested Maximum Operating Schedule:
24 hours/day **7** days/week
52 weeks/year **8,760** 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: **BM-13, BM-14, BM-15, BM-16, BM-21, BM-31**

2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:
BM-13: Ht = 22 ft, Dia = 0.7 ft, T = 70 °F, Flow Rates = 1,500 acfm and 1,500 dscfm
BM-14: Ht = 22 ft, Dia = 0.7 ft, T = 70 °F, Flow Rates = 1,500 acfm and 1,500 dscfm
BM-15: Ht = 22 ft, Dia = 0.7 ft, T = 70 °F, Flow Rates = 1,500 acfm and 1,500 dscfm
BM-16: Ht = 22 ft, Dia = 0.7 ft, T = 70 °F, Flow Rates = 1,500 acfm and 1,500 dscfm
BM-21: Ht = 22 ft, Dia = 0.7 ft, T = 70 °F, Flow Rates = 1,500 acfm and 1,500 dscfm
BM-31: Ht = 34 ft, Dia = 0.7 ft, T = 70 °F, Flow Rates = 1,500 acfm and 1,500 dscfm

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

N/A

5. Discharge Type Code: **H**

6. Stack Height: feet

7. Exit Diameter: feet

8. Exit Temperature: deg F

9. Actual Volumetric Flow Rate: acfm
acfm

10. Water Vapor: **0 %**

11. Maximum Dry Standard Flow Rate: dscfm

12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates...
Zone: **17** East (km):
North (km):

14. Emission Point Latitude/Longitude...
Latitude (DD/MM/SS)
Longitude (DD/MM/SS)

15. Emission Point Comment:
BM-13: East UTM = 439.391 km, and North UTM = 3,359.636 km, zone 17,
BM-14: East UTM = 439.389 km, and North UTM = 3,359.645 km, zone 17,
BM-15: East UTM = 439.387 km, and North UTM = 3,359.654 km, zone 17,
BM-16: East UTM = 439.385 km, and North UTM = 3,359.663 km, zone 17,
BM-21: East UTM = 439.306 km, and North UTM = 3,359.604 km, zone 17,
BM-31: East UTM = 439.377 km, and North UTM = 3,359.627 km, zone 17,

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1_ of 1_

1. Segment Description (Process/Fuel Type): **Lime handling, storage, and transfer operations**		
2. Source Classification Code (SCC): **30501605**	3. SCC Units: **Tons processed**	
4. Maximum Hourly Rate: **792** tons per day	5. Maximum Annual Rate: **289,080** tpy	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:		

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:		

EMISSIONS UNIT INFORMATION
Section [7] of [8]

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/PM10	**018**		**EL**
PM2.5	**018**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**

2. Total Percent Efficiency of Control:

3. Potential Emissions: lb/hour tons/year

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **N/A**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for emission calculations.**

BM-13: Emissions of PM/PM10 = 0.064 lb/hour and 0.07 tons/year
BM-14: Emissions of PM/PM10 = 0.064 lb/hour and 0.07 tons/year
BM-15: Emissions of PM/PM10 = 0.064 lb/hour and 0.07 tons/year
BM-16: Emissions of PM/PM10 = 0.064 lb/hour and 0.07 tons/year
BM-21: Emissions of PM/PM10 = 0.30 lb/hour and 0.33 tons/year
BM-31: Emissions of PM/PM10 = 0.13 lb/hour and 0.14 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Monitoring of baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**

2. Total Percent Efficiency of Control:

3. Potential Emissions: lb/hour tons/year

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **N/A**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for emission calculations.**

BM-13: Emissions of PM/PM10 = 0.032 lb/hour and 0.04 tons/year
BM-14: Emissions of PM/PM10 = 0.032 lb/hour and 0.04 tons/year
BM-15: Emissions of PM/PM10 = 0.032 lb/hour and 0.04 tons/year
BM-16: Emissions of PM/PM10 = 0.032 lb/hour and 0.04 tons/year
BM-21: Emissions of PM/PM10 = 0.15 lb/hour and 0.16 tons/year
BM-31: Emissions of PM/PM10 = 0.064 lb/hour and 0.07 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Monitoring of baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**

2. Basis for Allowable Opacity: ☒ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: **20** % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:
EPA Reference Method 9

5. Visible Emissions Comment:

Rule 62-296.320(4)(b), F.A.C.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:

2. Basis for Allowable Opacity: ☐ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:

5. Visible Emissions Comment:

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___ Not Applicable

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ☐ Previously Submitted, Date ______

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: ______
Test Date(s)/Pollutant(s) Tested: ______

☐ Previously Submitted, Date: ______
Test Date(s)/Pollutant(s) Tested: ______

☐ To be Submitted, Date (if known): ______
Test Date(s)/Pollutant(s) Tested: ______

☒ Not Applicable

Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☐ Attached, Document ID: ______ ☒ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
☐ Attached, Document ID: ________ ☐ Not Applicable

2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
☐ Attached, Document ID: ________ ☐ Not Applicable

3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
☐ Attached, Document ID: ________ ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
☐ Attached, Document ID: ________

2. Compliance Assurance Monitoring:
☐ Attached, Document ID: ________ ☐ Not Applicable

3. Alternative Methods of Operation:
☐ Attached, Document ID: ________ ☐ Not Applicable

4. Alternative Modes of Operation (Emissions Trading):
☐ Attached, Document ID: ________ ☐ Not Applicable

Additional Requirements Comment

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: **Limestone handling, storage and loadout**

3. Emissions Unit Identification Number: **BM-23**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **NA**	6. Initial Startup Date: **NA**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

☐ Hg Budget Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description:
Fabric filter

2. Control Device or Method Code: **018**

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:

2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:

2. Maximum Production Rate:

3. Maximum Heat Input Rate:

4. Maximum Incineration Rate: pounds/hr
tons/day

5. Requested Maximum Operating Schedule:
24 hours/day **7** days/week
52 weeks/year **8,760** hours/year

6. Operating Capacity/Schedule Comment:

EMISSIONS UNIT INFORMATION
Section [8] of [8]

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: **BM-23**

2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:
BM-23: Ht = 22 ft, Dia = 0.7 ft, T = 70 °F, Flow Rates = 1,500 acfm and 1,500 dscfm

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

N/A

5. Discharge Type Code: **H**

6. Stack Height: feet

7. Exit Diameter: feet

8. Exit Temperature: deg F **70**

9. Actual Volumetric Flow Rate: acfm
acfm

10. Water Vapor: **0 %**

11. Maximum Dry Standard Flow Rate: dscfm

12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates...
Zone: **17** East (km):
North (km):

14. Emission Point Latitude/Longitude...
Latitude (DD/MM/SS)
Longitude (DD/MM/SS)

15. Emission Point Comment:
BM-23: East UTM = 439.337 km, and North UTM = 3,359.591 km, zone 17,

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1_ of 1_

1. Segment Description (Process/Fuel Type): **Limestone handling, storage and loadout**		
2. Source Classification Code (SCC): **30501605**	3. SCC Units: **Tons processed**	
4. Maximum Hourly Rate: **792** tons per hour	5. Maximum Annual Rate: **289,080** tpy	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:		

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:		

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/PM10	**018**		**EL**
PM2.5	**018**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **N/A**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for emission calculations.**

BM-23: Emissions of PM/PM10 = 0.13 lb/hour and 0.14 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

EMISSIONS UNIT INFORMATION **POLLUTANT DETAIL INFORMATION**
Section [8] of [8] Page **[2] of [4]**

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Monitoring of baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**

2. Total Percent Efficiency of Control:

3. Potential Emissions: lb/hour tons/year

4. Synthetically Limited? ☐ Yes ☒ No

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

6. Emission Factor: **N/A**

7. Emissions Method Code: **0**

8.a. Baseline Actual Emissions (if required): tons/year

8.b. Baseline 24-month Period: From: To:

9.a. Projected Actual Emissions (if required): tons/year

9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions: **See Appendix C for emission calculations.**

BM-23: Emissions of PM/PM10 = 0.06 lb/hour and 0.07 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Monitoring of baghouse.**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT – Rule 62-212.400(10)(b), F.A.C.**	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**

2. Basis for Allowable Opacity: ☒ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: **20** % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:
EPA Reference Method 9

5. Visible Emissions Comment:

Rule 62-296.320(4)(b), F.A.C.

NSPS Submpart OOO

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:

2. Basis for Allowable Opacity: ☐ Rule ☐ Other

3. Allowable Opacity:
Normal Conditions: % Exceptional Conditions: %
Maximum Period of Excess Opacity Allowed: min/hour

4. Method of Compliance:

5. Visible Emissions Comment:

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___ **Not Applicable**

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ☐ Previously Submitted, Date ___

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ___________ ☐ Previously Submitted, Date ___________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ___________ ☐ Previously Submitted, Date ___________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ___________ ☐ Previously Submitted, Date ___________
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ___________ ☐ Previously Submitted, Date ___________
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: ___________
Test Date(s)/Pollutant(s) Tested: ___________

☐ Previously Submitted, Date: _________
Test Date(s)/Pollutant(s) Tested: ___________

☐ To be Submitted, Date (if known): ___________
Test Date(s)/Pollutant(s) Tested: ___________

☒ Not Applicable

Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☐ Attached, Document ID: ___________ ☒ Not Applicable

EMISSIONS UNIT INFORMATION
Section [8] of [8]

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
   ☐ Attached, Document ID: __________ ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
   ☐ Attached, Document ID: __________ ☐ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
   ☐ Attached, Document ID: __________ ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
   ☐ Attached, Document ID: __________
2. Compliance Assurance Monitoring:
   ☐ Attached, Document ID: __________ ☐ Not Applicable
3. Alternative Methods of Operation:
   ☐ Attached, Document ID: __________ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading):
   ☐ Attached, Document ID: __________ ☐ Not Applicable

Additional Requirements Comment

APPENDIX E

RBLC TABLES

Table 1 EPA RBLC Database - Lime Storage Silos and Material Handling

Year	Company	Facility	RBLC	Source Description	Production Rate	Add-On Controls	Pollutant	BACT	Limit / Emission Factor
2011	Specialty Minerals Inc (SMI)	Superior	WI-0252	Storage Silo for Calcium Oxide		Fabric Filter	FPM2.5	PNEUMATIC CONVEYING, TOTAL ENCLOSURE AND BIN VENT FABRIC FILTER.	0.026 LB/H 0.001 GR/ACF METHOD 201A WITH PM2.5 SAMPLING HEAD AND METHOD 202
2011	Specialty Minerals Inc (SMI)	Superior	WI-0252	Storage Silo for Calcium Oxide		Fabric Filter	PM	PNEUMATIC CONVEYING, TOTAL ENCLOSURE AND BIN VENT FABRIC FILTER.	0.13 LB/H 0.005 GR/DSCF Method 5 and 202
2011	Specialty Minerals Inc (SMI)	Superior	WI-0252	Storage Silo for Calcium Oxide		Fabric Filter	VE	Fabric Filter	10 % opacity
2010	Consolidated Environmental Management	Nucor Steel Louisiana	LA-0239	Two Lime Silos - Powdered lime received by barge or truck and blown into lime storage silos	21,810 tpy	Fabric Filter	FPM	Fabric Filter	0.005 LB/H 0.024 T/YR
2010	East Kentucky Power Cooperative	J.K. Smith Generating Station	KY-0100	Lime Storage Silos		Fabric Filter	FPM10	0.0050 GR/DSCF	BACT FOR PM10 AND 2.5. 0.30 LBS/HOUR FROM EACH FRESH LIME SILO
2010	East Kentucky Power Cooperative	J.K. Smith Generating Station	KY-0100	Limestone Storage Silos	40 TPH	Fabric Filter	FPM10	0.0050 GR/DSCF	0.005 GR/DSCF 24 HR 0.51 LB/H (EACH) 24 HR
2009	Southeast Idaho Energy LLC	Power County Advanced Energy Center	ID-0017	Storage Silos	250 TPH	Baghouse	FPM10	.0020 lb/hr	High efficiency baghouses on silo vents
2009	Southeast Idaho Energy LLC	Power County Advanced Energy Center	ID-0017	Storage Silos	250 TPH	Baghouse	PM	.0020 lb/hr	High efficiency baghouses on silo vents - 20 % opacity
2009	Southeast Idaho Energy LLC	Power County Advanced Energy Center	ID-0017	Truck load out and conveying			Opacity	20% Opacity	Covered conveyors and enclosed transfer points. Fugitive dust bmps
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Stone Crushing and Screening			PM	BEST AVAILABLE CONTROL MEASURES: MAINTAIN INHERENT MOISTURE AND INCLUDE MANY VIBRATING FEEDERS AND MATERIAL HANDLING PROCESSES WITHIN TUNNEL ENCLOSURES.	9.79 T/YR PM 10 PER ROLLING 12-MONTH PERIOD 26.9 T/YR PM PER ROLLING 12-MONTH PERIOD
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Stone Crushing and Screening			Opacity	BEST AVAILABLE CONTROL MEASURES: MAINTAIN INHERENT MOISTURE AND INCLUDE MANY VIBRATING FEEDERS AND MATERIAL HANDLING PROCESSES WITHIN TUNNEL ENCLOSURES.	10 % OPACITY AS 6-MIN. AVG., SCREENS/TRANSFER 15 % OPACITY AS A 6 MIN AVG, CRUSHERS
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Product Transfer, Processed Stone, Conveying at Kiln	5000000 T/YR	Baghouse	FMP10	THE T/YR LIMITS ARE FOR PM 10, FUGITIVE AND INSIDE MATERIAL HANDLING STACK (NOT KILN STACK).	1.23 T/YR PER ROLLING 12-MONTH PERIOD FROM STACK 1.03 T/YR PER ROLLING 12-MONTH PERIOD FOR FUGITIVE 0.0070 GR/DSCF
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Product Transfer, Processed Stone, Conveying at Kiln	5000000 T/YR		PM (fugitive)		1.91 T/YR PER ROLLING 12-MONTH PERIOD
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Product Transfer, Processed Stone, Conveying at Kiln	5000000 T/YR	Baghouse	Opacity	Baghouse	20 % OPACITY OF FUGITIVE DUST AS 3-MIN. AVG. 0 % OPACITY AS 6-MIN. AVERAGE FROM BAGHOUSE
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Lime Load-Out, Screening Transfer, Storage	300 T/H	Baghouse	FPM10	BAGHOUSES (2) WHICH SHALL ACHIEVE 99.5% CAPTURE EFFICIENCY	3.32 T/YR PER ROLLING 12-MONTH PERIOD 0.005 GR/DSCF FOR BAGHOUSE STACKS
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Lime Load-Out, Screening Transfer, Storage	300 T/H		PM (fugitive)		0.98 T/YR FUGITIVE PM10 PER ROLLING 12-MO. PERIOD 1.93 T/YR FUGITIVE PM PER ROLLING 12-MONTH PERIOD
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Lime Load-Out, Screening Transfer, Storage	300 T/H	Baghouse	Opacity	FUGITIVE DUST IS FROM SCREENING, TRANSFER TO STORAGE, AND LOAD-OUT SPOUTS.	20 % OPACITY OF FUGITIVE DUST AS 3-MIN. AVG. 0 % OPACITY AS A 6-MINUTE AVG. BOTH STACKS
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Dust Load-Out System from Bins to Trucks	100 T/H	Baghouse	FPM10	BAGHOUSE WITH 99.5% CAPTURE EFFICIENCY. MECHANICAL ENCLOSURED FOR CONVEYING EQUIPMENT	8.1 T/YR PER ROLLING 12-MONTH PERIOD 0.01 GR/DSCF FROM BAGHOUSE
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Dust Load-Out System from Bins to Trucks	100 T/H		PM (fugitive)		0.21 T/YR FUGITIVE PM10 PER ROLLING 12-MO. PERIOD 0.39 T/YR FUGITIVE PM PER ROLLING 12-MONTH PERIOD
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	Dust Load-Out System from Bins to Trucks	100 T/H	Baghouse	Opacity	Baghouse	20 % OPACITY OF FUGITIVE DUST AS 3-MIN. AVG. 0 % OPACITY AS A 6-MINUTE AVERAGE FOR STACKS

Table 1 EPA RBLC Database - Lime Storage Silos and Material Handling

Year	Company	Facility	RBLC	Source Description	Production Rate	Add-On Controls	Pollutant	BACT	Limit / Emission Factor
2008	Tate & Lyle Ingredients Americas	Webster County	IA-0095	Lime Silo	150 Tons	Dust Collector	FPM10	Dust Collector	0.005 GR/DSCF AVERAGE OF THREE STACK TEST RUNS
2008	Tate & Lyle Ingredients Americas	Webster County	IA-0095	Lime Silo	150 Tons	Dust Collector	PM	DUST COLLECTOR PM LIMIT INCLUDES BOTH FILTERABLE AND CONDENSABLE PORTION OF PARTICULATE MATTER	0.005 GR/DSCF AVERAGE OF THREE STACK TEST RUNS
2008	Tate & Lyle Ingredients Americas	Webster County	IA-0095	Lime Silo	150 Tons	Dust Collector	Opacity		0 % SIX-MINUTE AVERAGE
2008	Louisiana Generating LLC	Big Cajun Power Plant	LA-0223	Lime Silo	20 T/H	Fabric Filter	FPM10	Fabric Filter	0.22 LB/HR 0.01 TPY
2008	Louisiana Generating LLC	Big Cajun Power Plant	LA-0223	Limestone Tower Conveyor Transfer	200 T/H			WIND SCREENS AND DRY FOGGING	0.01 LB/HR 0.01 TPY
2008	Louisiana Generating LLC	Big Cajun Power Plant	LA-0223	Limestone Silo and Crusher	200 T/H	Fabric Filter		Fabric Filter	0.02 LB/HR 0.02 TPY
2008	Louisiana Generating LLC	Big Cajun Power Plant	LA-0223	Limestone Storage Dome	1400 T/H	Fabric Filter		Fabric Filter	0.01 LB/HR 0.01 TPY
2007	Entergy Louisiana LLC	Little Gypsy Generating Plant	LA-0221	Limestone Storage Pile	96,000 T/YR			Dust Suppression	170.58 LB/H 1.82 T/YR
2005	Chemical Lime	O'Neal Plant	AL-0220	RAW MATERIALS HANDLING			PM	Source consists of several units.	Some units have limits of 0.005 gr/dscf while the remaining units have a limit of 0.009 gr/dscf
2005	Chemical Lime	O'Neal Plant	AL-0220	KILN DUST BINS & REJECT LIME BINS			PM	Source consists of several units.	Some units have limits of 0.005 gr/dscf while the remaining units have a limit of 0.009 gr/dscf
2005	Chemical Lime	O'Neal Plant	AL-0220	LIME PRODUCT HANDLING & STORAGE			PM	Source consists of several units.	Some units have limits of 0.005 gr/dscf while the remaining units have a limit of 0.009 gr/dscf
2005	Chemical Lime	O'Neal Plant	AL-0220	LIME PRODUCT LOADOUT (TRUCKS & RAILCARS)			PM	Source consists of several units.	Some units have limits of 0.005 gr/dscf while the remaining units have a limit of 0.009 gr/dscf
2003	PLUM POINT ASSOCIATES, LLC	PLUM POINT ENERGY	AR-0074	MATERIAL HANDLING, LIME, BAGHOUSES			FPM10	lime storage, controlled by Baghouse	0.1 lb/hr
2003	NUCOR CORPORATION	NUCOR STEEL, ARKANSAS	AR-0078	Lime Silo		Baghouse	FPM10	lime storage, controlled by Baghouse	0.1 lb/hr 0.1 tpy 0.005 gr/dscf
2005	Arkansas Lime	Batesville	AR-0082	LIME DISCHARGE, SN-32Q #3			Opacity		5% opacity
2005	Arkansas Lime	Batesville	AR-0082	LIME DISCHARGE, SN-32Q #3		Dust Collector	PM	Dust Collector (99% CE)	0.01 gr/dscf
2005	Arkansas Lime	Batesville	AR-0082	KILN FEED BELT INTO NO. 3 KILN SURGE BIN, SN-35Q			Opacity		10% opacity
2005	Arkansas Lime	Batesville	AR-0082	LIME STORAGE SILO DUST COLLECTORS, SN-36Q AND SN-37Q			Opacity		5% opacity
2005	Arkansas Lime	Batesville	AR-0082	LIME STORAGE SILO DUST COLLECTORS, SN-36Q AND SN-37Q		Dust Collector	FPM10	Dust Collector (99% CE)	0.015 gr/dscf
2005	Arkansas Lime	Batesville	AR-0082	LIME LOADOUT DUST COLLECTOR, SN-38Q AND SN-39Q			Opacity		5% opacity
2005	Arkansas Lime	Batesville	AR-0082	LIME LOADOUT DUST COLLECTOR, SN-38Q AND SN-39Q		Dust Collector	FPM10	Dust Collector (99% CE)	0.015 gr/dscf
2005	Arkansas Lime	Batesville	AR-0082	LIMESTONE TRANSFER POINTS, SN-31Q			Opacity		20% opacity
2006	LAMAR UTILITIES BOARD DBA LAMAR LIGHT & POWER	LAMAR LIGHT & POWER PLANT	CO-0055	LIMESTONE HANDLING /PROCESSING/ STORAGE - LIME STORAGE SILO, CONVEYORS, CRUSHER, DAYSILOS.	30 T/H	Baghouse	FPM10	Dust Collector (99.5% CE)	0.045 lb/t (total of 2 Baghouse outlets)
2005	PUBLIC SERVICE COMPANY OF COLORADO	COMANCHE STATION	CO-0057	Lime Silos (two)		Baghouse	PM	SILOS ARE EQUIPPED WITH BAGHOUSES	0.01 gr/dscf, 3-hr avg
2007	UNIVERSITY OF NORTHERN IOWA	UNIVERSITY OF NORTHERN IOWA	IA-0086	Limestone Silo	10 T/H		PM		0.005 gr/dscf, 3-hr avg (front and back half)
2007	UNIVERSITY OF NORTHERN IOWA	UNIVERSITY OF NORTHERN IOWA	IA-0086	Limestone Silo	10 T/H		FPM10		0.005 gr/dscf, 3-hr avg (front and back half)
2007	UNIVERSITY OF NORTHERN IOWA	UNIVERSITY OF NORTHERN IOWA	IA-0086	Limestone Silo	10 T/H		Opacity		5% opacity, 1-hr avg

Table 1 EPA RBLC Database - Lime Storage Silos and Material Handling

Year	Company	Facility	RBLC	Source Description	Production Rate	Add-On Controls	Pollutant	BACT	Limit / Emission Factor
2006	CLECO POWER, LLC	RODEMACHER BROWNFIELD UNIT 3	LA-0202	36-08 FUEL/LIMESTONE DIVERTER TOWER	1,500 tph		FPM10	WET SUPPRESSION, COVERED CONVEYORS, ENCLOSED DROP POINTS, LOWERING TUBES FOR DIVERTING MATERIALS TO STORAGE PILES AND BEST OPERATING PRACTICES ARE BACT FOR MATERIAL HANDLING.	2.59 lb/hr 0.12 tpy
2006	CLECO POWER, LLC	RODEMACHER BROWNFIELD UNIT 3	LA-0202	CRUSHED LIMESTONE DAY BINS (2)	6000 cfm		FPM10		0.51 lb/hr 2.25 tpy
2006	CLECO POWER, LLC	RODEMACHER BROWNFIELD UNIT 3	LA-0202	COVERED LIMESTONE STOCKOUT PILE-DROP POINT	1,500 tph		FPM10	LOWERING TUBE	2.59 lb/hr 0.05 tpy
2006	CLECO POWER, LLC	RODEMACHER BROWNFIELD UNIT 3	LA-0202	LIMESTONE STOCKOUT PILE	3,002 cu yd / yr		FPM10	PILE COVERED	32.9 lb/hr 0.02 tpy
2006	CLECO POWER, LLC	RODEMACHER BROWNFIELD UNIT 3	LA-0202	INACTIVE LIMESTONE PILE	378,381 cu yd /yr		FPM10		823.2 lb/hr 0.46 tpy
2003	BULL MOUNTAIN DEV. COMPANY	BULL MOUNTAIN, NO. 1, LLC - ROUNDUP POWER PROJECT	MT-0022	MATERIAL TRANSFER, LIME HANDLING TRANSFER POINTS		Baghouse	FPM10	PNEUMATIC TRANSFERS AND BAGHOUSE	0.01 gr/dscf
2002	ROCKY MOUNTAIN POWER, INC.	HARDIN GENERATOR PROJECT	MT-0027	MATERIAL TRANSFER, LIME HANDLING TRANSFER POINTS		Baghouse	FPM10	DUST SUPPRESSION SYSTEMS AND ENCLOSURES, BAGHOUSE	0.01 gr/dscf 0.082 lb/t
2005	MONTANA DAKOTA UTILITIES / WESTMORELAND POWER	GASCOYNE GENERATING STATION	ND-0021	MATERIALS HANDLING	100 tph	Baghouse	Opacity	Baghouse (99.9% CE)	5% Opacity, 6-min avg
2005	MONTANA DAKOTA UTILITIES / WESTMORELAND POWER	GASCOYNE GENERATING STATION	ND-0021	MATERIALS HANDLING	100 tph	Baghouse	PM	Baghouse (99.9% CE)	0.005 gr/dscf, 3-hr avg
2007	GREAT RIVER ENERGY	SPIRITWOOD STATION	ND-0024	MATERIALS HANDLING	60 tph	Baghouse	FPM10	Baghouse (99.9% CE)	0.005 gr/dscf, 3-hr avg
2007	GREAT RIVER ENERGY	SPIRITWOOD STATION	ND-0024	MATERIALS HANDLING	60 tph	Baghouse	Opacity	Baghouse (99.9% CE)	5% Opacity from transfers fugitive 15% Opacity from crusher 7% opacity from transfers stack
2003	FIRST ENERGY	TOLEDO EDISON CO. - BAYSHORE PLANT	OH-0231	LIMESTONE CRUSHING, SIZING, AND CONVEYING		Baghouse	Opacity	Baghouse (99.9% CE)	10% Opacity
2003	FIRST ENERGY	TOLEDO EDISON CO. - BAYSHORE PLANT	OH-0231	LIMESTONE CRUSHING, SIZING, AND CONVEYING		Baghouse	PM	Baghouse (99.9% CE)	0.05 gr/dscf 14.2 tpy
2003	FIRST ENERGY	TOLEDO EDISON CO. - BAYSHORE PLANT	OH-0231	LIMESTONE CRUSHING, SIZING, AND CONVEYING		Baghouse	FPM10	Baghouse	12.8 tpy
2003	FIRST ENERGY	TOLEDO EDISON CO. - BAYSHORE PLANT	OH-0231	LIMESTONE DRYER		Fabric Filter	PM	Fabric Filter (99% CE)	0.002 lb/hr 0.008 tpy
2003	FIRST ENERGY	TOLEDO EDISON CO. - BAYSHORE PLANT	OH-0231	LIMESTONE DRYER		Fabric Filter	FPM10	Fabric Filter (99% CE)	0.001 lb/hr 0.004 tpy
2003	FIRST ENERGY	TOLEDO EDISON CO. - BAYSHORE PLANT	OH-0231	LIMESTONE DRYER		Fabric Filter	Opacity	Fabric Filter (99% CE)	20% Opacity, 6-min avg
2003	Carmeuse	Maple Grove	OH-0270	PRODUCT STORAGE/LOADOUT #1			Opacity	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	7% Opacity stack 10% Opacity fugitive
2003	Carmeuse	Maple Grove	OH-0270	PRODUCT STORAGE/LOADOUT #1			PM	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	0.62 lb/hr 2.72 tpy 0.02 lb/t
2003	Carmeuse	Maple Grove	OH-0270	PRODUCT STORAGE/LOADOUT #1			FPM10	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	0.3 tpy
2003	Carmeuse	Maple Grove	OH-0270	LIMESTONE MATERIAL HANDLING			PM	WATER APPLICATION.	4.34 tpy
2003	Carmeuse	Maple Grove	OH-0270	LIMESTONE MATERIAL HANDLING			FPM10	WATER APPLICATION.	2.1 tpy
2003	Carmeuse	Maple Grove	OH-0270	LIMESTONE MATERIAL HANDLING			Opacity	WATER APPLICATION.	10% Opacity
2003	Carmeuse	Maple Grove	OH-0270	LIME MATERIAL HANDLING #2		Baghouse	PM	Baghouse	1.38 lb/hr 6.04 tpy 0.05 lb/t 0.01 gr/dscf
2003	Carmeuse	Maple Grove	OH-0270	LIME MATERIAL HANDLING #2		Baghouse	Opacity	Baghouse	7% Opacity stack
2003	Carmeuse	Maple Grove	OH-0270	LIME MATERIAL HANDLING #1		Baghouse	PM	Baghouse	1.05 lb/hr 4.6 tpy 0.04 lb/t 0.01 gr/dscf
2003	Carmeuse	Maple Grove	OH-0270	LIME MATERIAL HANDLING #1		Baghouse	Opacity	Baghouse	7% Opacity stack
2003	Carmeuse	Maple Grove	OH-0270	COMMON PRODUCT HANDLING			PM	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	1.77 lb/hr stack 7.75 tpy 0.04 lb/t 0.01 gr/dscf

Table 1 EPA RBLC Database - Lime Storage Silos and Material Handling

Year	Company	Facility	RBLC	Source Description	Production Rate	Add-On Controls	Pollutant	BACT	Limit / Emission Factor
2003	Carmeuse	Maple Grove	OH-0270	COMMON PRODUCT HANDLING			FPM10	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	0.3 tpy fugitive
2003	Carmeuse	Maple Grove	OH-0270	COMMON PRODUCT HANDLING			Opacity	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	7% Opacity stack 10% Opacity fugitive
2003	Carmeuse	Maple Grove	OH-0270	PRODUCT STORAGE/LOADOUT #2			PM	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	1.3 lb/hr stack 5.69 tpy 0.05 lb/t 0.01 gr/dscf
2003	Carmeuse	Maple Grove	OH-0270	PRODUCT STORAGE/LOADOUT #2			FPM10	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	1.13 tpy fugitive
2003	Carmeuse	Maple Grove	OH-0270	PRODUCT STORAGE/LOADOUT #2			Opacity	WORK PRACTICES THAT MINIMIZE OR ELIMINATE VISIBLE EMISSIONS OF FUGITIVE DUST.	7% Opacity stack 10% Opacity fugitive
2003	Carmeuse	Maple Grove	OH-0270	KILN DUST HANDLING			Opacity	WATERING OF DUST AND BAGHOUSE.	7% Opacity stack 10% Opacity fugitive
2003	Carmeuse	Maple Grove	OH-0270	KILN DUST HANDLING			FPM10	WATERING OF DUST AND BAGHOUSE	0.21 tpy fugitive 0.0018 lb/t
2003	Carmeuse	Maple Grove	OH-0270	KILN DUST HANDLING			PM	WATERING OF DUST AND BAGHOUSE.	0.5 tpy fugitive 1.05 tpy stack 0.01 gr/dscf stack 0.24 lb/hr stack
2003	Carmeuse	Maple Grove	OH-0270	MATERIAL STORAGE PILES			Opacity	WATER APPLICATIONS AND DAILY INSPECTIONS OF EACH STORAGE PILE.	0% Opacity
2003	Carmeuse	Maple Grove	OH-0270	MATERIAL STORAGE PILES			PM	WATER APPLICATIONS AND DAILY INSPECTIONS OF EACH STORAGE PILE.	0.61 tpy
2003	Carmeuse	Maple Grove	OH-0270	MATERIAL STORAGE PILES			FPM10	WATER APPLICATIONS AND DAILY INSPECTIONS OF EACH STORAGE PILE.	0.4 tpy
2004	SANTEE COOPER	Cross Generating Station	SC-0104	LIMESTONE HANDLING	230000 tpy	Baghouse	PM	Baghouse (99% CE)	0.0002 lb/hr each conveyor drop 0.022 gr/dscf
2004	SANTEE COOPER	Cross Generating Station	SC-0104	LIMESTONE TRUCK UNLOADING			PM		0.02 lb/hr fugitive
2004	SANTEE COOPER	Cross Generating Station	SC-0104	LIMESTONE STORAGE PILE			PM		0.29 lb/hr fugitive
2003	Austin White	McNeil	TX-0452	WEST BINS 1-3		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.02 lb/hr 0.07 tpy
2003	Austin White	McNeil	TX-0452	HYDRATE BAGGERS		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.47 lb/hr 2.06 tpy
2003	Austin White	McNeil	TX-0452	KILN NO 3 DUST BIN		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.18 lb/hr 0.12 tpy
2003	Austin White	McNeil	TX-0452	HYDRATE BIN NO1 AND 2		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.15 lb/hr 0.66 tpy
2003	Austin White	McNeil	TX-0452	APRON CONVEYOR		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.26 lb/hr 1.13 tpy

[redacted]

Table 1 EPA RBLC Database - Lime Storage Silos and Material Handling

Year	Company	Facility	RBLC	Source Description	Production Rate	Add-On Controls	Pollutant	BACT	Limit / Emission Factor
2003	Austin White	McNeil	TX-0452	PULVERIZED PRODUCT BIN, HYDATOR NO 4-5 SURGE BIN		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.02 lb/hr 0.07 tpy
2003	Austin White	McNeil	TX-0452	PRODUCT LOADING BLOWBACK		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.06 lb/hr 0.003 tpy
2003	Austin White	McNeil	TX-0452	PRODUCT LOADING		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	1.84 lb/hr 1.26 tpy
2003	Austin White	McNeil	TX-0452	HYDRATE LOADING SPOUT		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.31 lb/hr 0.96 tpy
2003	Austin White	McNeil	TX-0452	CRUSHING AND SCREENING 'A' SECTION FUGITIVES (4)			PM		9.81 lb/hr 10.72 tpy
2003	Austin White	McNeil	TX-0452	CRUSHING AND SCREENING 'A' SECTION FUGITIVES (4)			FPM10		4.66 lb/hr 4.88 tpy
2003	Austin White	McNeil	TX-0452	CRUSHING AND SCREENING 'C' SECTION FUGITIVES (4)			PM		14.59 lb/hr 15.28 tpy
2003	Austin White	McNeil	TX-0452	CRUSHING AND SCREENING 'C' SECTION FUGITIVES (4)			FPM10		6.95 lb/hr 7.27 tpy
2003	Austin White	McNeil	TX-0452	KILNS NO1/2 DUST STOCKPILE			PM		0.008 lb/hr 0.034 tpy
2003	Austin White	McNeil	TX-0452	KILN 3 STOCKPILE FUGITIVES			PM		0.6 lb/hr 2.61 tpy
2003	Austin White	McNeil	TX-0452	KILN NO 1/2 REJECT BIN		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	3.66 lb/hr 2.01 tpy
2003	Austin White	McNeil	TX-0452	KILN NO 3 DUST BIN		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.17 lb/hr 0.75 tpy
2003	Austin White	McNeil	TX-0452	WET FINES BIN		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.13 lb/hr 0.55 tpy
2003	Austin White	McNeil	TX-0452	PRODUCT TOWER		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	1.03 lb/hr 4.51 tpy
2003	Austin White	McNeil	TX-0452	WEST BIN 4/5		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.02 lb/hr 0.07 tpy

Table 1 EPA RBLC Database - Lime Storage Silos and Material Handling

Year	Company	Facility	RBLC	Source Description	Production Rate	Add-On Controls	Pollutant	BACT	Limit / Emission Factor
2003	Austin White	McNeil	TX-0452	QUICKLIME BINS 1-7		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.09 lb/hr 0.39 tpy
2003	Austin White	McNeil	TX-0452	QUICKLIME BIN 8		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.06 lb/hr 0.26 tpy
2003	Austin White	McNeil	TX-0452	OFF SPEC PEBBLE LOADOUT		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	9 lb/hr 1.2 tpy
2003	Austin White	McNeil	TX-0452	PEBBLE BAGGING		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.32 lb/hr 1.41 tpy
2003	Austin White	McNeil	TX-0452	BULK PULVERIZER		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.13 lb/hr 0.56 tpy
2003	Austin White	McNeil	TX-0452	PULVERIZER LOADOUT		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.09 lb/hr 0.38 tpy
2003	Austin White	McNeil	TX-0452	PRODUCT BIN NO 1-7 LOADOUT		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.09 lb/hr 0.38 tpy
2003	Austin White	McNeil	TX-0452	PULVERIZED QUICKLIME BAGGER		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.66 lb/hr 2.89 tpy
2003	Austin White	McNeil	TX-0452	HYDRATE BINS 3-7		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.47 lb/hr 2.06 tpy
2003	Austin White	McNeil	TX-0452	LIME HYDRATOR 4-5		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	5.88 lb/hr 25.75 tpy
2003	Austin White	McNeil	TX-0452	HYDRATE MILLLING		Dust Collector	FPM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.34 lb/hr 1.5 tpy

Table 1 EPA RBLC Database - Lime Storage Silos and Material Handling

Year	Company	Facility	RBLC	Source Description	Production Rate	Add-On Controls	Pollutant	BACT	Limit / Emission Factor
2003	Austin White	McNeil	TX-0452	HYDRATE REJECT BIN		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.15 lb/hr 0.007 tpy
2003	Austin White	McNeil	TX-0452	HYDRATE REJECTS		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.09 lb/hr 0.38 tpy
2003	Austin White	McNeil	TX-0452	HYDRATE LOADOUT		Dust Collector	PM	THE FUEL HANDLING AND PRODUCT HANDLING EQUIPMENT AND STORAGE BINS ARE CONTROLLED WITH DUST COLLECTORS, ENCLOSURES, COVERED SPOUTS, AND WATER SPRAYS FOR PM CONTROL	0.15 lb/hr 0.66 tpy
2003	STORA ENSO NORTH AMERICA	WHITING MILL	WI-0205	LIME STORAGE / RECEIVING, P01, S01			PM	BIN VENT BAGHOUSE (99.9% CE)	0.3 lb/hr 0.11 lb/t
2003	MANITOWOC PUBLIC UTILITIES	MANITOWOC PUBLIC UTILITIES	WI-0225	LIME STORAGE SILO		Baghouse	FPM10	BAGHOUSE, EXHAUST EMISSIONS REDIRECTED INTO ENCLOSURE	
2003	MANITOWOC PUBLIC UTILITIES	MANITOWOC PUBLIC UTILITIES	WI-0225	LIME RAILCAR / TRUCK UNLOADING (F23)			PM	FUGITIVE DUST CONTROL	7% Opacity fugitive
2004	WISCONSIN PUBLIC SERVICE	WPS - WESTON PLANT	WI-0228	P44, S44, SYSTEM 1 - LIME STORAGE SILO BIN VENT #22		Baghouse	PM10	FABRIC FILTER BAGHOUSE	0.01 gr/dscf 0.1 lb/hr (front and back half)
2004	WISCONSIN PUBLIC SERVICE	WPS - WESTON PLANT	WI-0228	P45, S45, SYSTEM 2 - LIME DAY BIN VENT, #27		Baghouse	PM10	FABRIC FILTER BAGHOUSE	0.01 gr/dscf 0.26 lb/hr (front and back half)
2006	Graymont	Superior	WI-0233	LIME CRUSHING AND HANDLING (P51)		Baghouse	PM	FABRIC FILTER BAGHOUSE (99% CE), WITH TOTAL ENCLOSURE OF PROCESS OPERATIONS	0.58 lb/hr 0.0114 gr/dscm
2006	Graymont	Superior	WI-0233	LIME STORAGE AND HANDLING (P52)		Baghouse	PM	FABRIC FILTER BAGHOUSE, TOTAL ENCLOSURE OF THE PROCESS OPERATIONS	0.56 lb/hr 0.0114 gr/dscm (0.0003 gr/dscf)
2006	Graymont	Superior	WI-0233	SMALL SILO TRUCK LOADING (P53)		Baghouse	PM	FABRIC FILTER BAGHOUSE, TOTAL ENCLOSURE OF THE PROCESS OPERATIONS, USE OF A VACUUM RING FOR TRUCK FILLING	0.06 lb/hr 0.0114 gr/dscm (0.0003 gr/dscf)
2006	Graymont	Superior	WI-0233	LARGE SILO TRUCK LOADING (P54)		Baghouse	PM	FABRIC FILTER BAGHOUSE, TOTAL ENCLOSURE OF THE PROCESS OPERATIONS, USE OF A VACUUM RING FOR TRUCK FILLING	0.04 lb/hr 0.0114 gr/dscm (0.0003 gr/dscf)
2006	Graymont	Superior	WI-0233	LIME FINES STORAGE (FOR ALL KILNS) P56		Baghouse	PM	FABRIC FILTER BAGHOUSE, TOTAL ENCLOSURE OF OPERATIONS	0.17 lb/hr 0.0114 gr/dscm (0.0003 gr/dscf)
2006	Graymont	Superior	WI-0233	OFF SPEC. BIN STORAGE AND HANDLING (P57)		Baghouse	PM	FABRIC FILTER BAGHOUSE, TOTAL ENCLOSURE OF PROCESS OPERATIONS	0.04 lb/hr 0.0114 gr/dscm (0.0003 gr/dscf)
2006	Graymont	Superior	WI-0233	CORE BIN TRUCK LOADING (P58)		Baghouse	PM	FABRIC FILTER BAGHOUSE, TOTAL ENCLOSURE, EXCEPT FOR TRUCK PAD. VACUUM RING FOR TRUCK FILLING	0.06 lb/hr 0.0114 gr/dscm (0.0003 gr/dscf)
2006	Western Greenbrier Co-Generation, LLC	Western Greenbrier Co-Generation, LLC	WV-0024	LIMESTONE HANDLING	100 tph	Fabric Filter	PM	Fabric Filter	0.01 gr/dscf
2006	Western Greenbrier Co-Generation, LLC	Western Greenbrier Co-Generation, LLC	WV-0024	LIMESTONE HANDLING	100 tph	Fabric Filter	PM	Fabric Filter	0.01 gr/dscf

Table 2 EPA RBLC Database - Kiln NSR Projects 2000 - Current

Year	Company	Facility	RBLC	Product	Fuel	Design	Project Description	Production Rate	Add-On Controls	Continuous Monitoring	Normalized CO (lb/t lime produced)	CO BACT	CO Limit / Emission Factor
2010	Chemical Lime	Clifton	TX-0561	CaO	*petcoke, coal, natural gas*	vertical	Petcoke firing - *Kiln 3*	*25 ton/hr lime*	Wet scrubber		3.5	Good combustion practices and *proper kiln design*	87 lb/hr limit
2009	**Graymont**	**Superior**	**WI-0250**	**CaO**	**coal, pet coke**	**preheater**	**Modification to Kiln 5**	**650 tpd lime**	**baghouse**	**SO_2, NO_X and CO CEMS**	**7.2**	**(a) use of a preheater type rotary kiln and (b) good operating practices within the kiln and preheater.**	**1.56 lbs/tsf (stone), 24-hr rolling avg firing low organic stone 310 lb/hr, 3-hr avg firing high organic stone 71.2 t/month, 12-month avg**
2005	Chemical Lime	O'Neal Plant	AL-0220	CaO	coal	preheater	New preheater rotary kiln and modification to existing *kiln* (same limits for both)	1,500 tpd lime		SO_2 CEMS *CO CEMS*	2.5		2.5 lb/t lime annual average 156.25 lb/hr
2005	**Arkansas Lime**	**Batesville**	**AR-0082**	**CaO**	**coal, coke, NG**	**preheater**	**New rotary preheater kiln - Kiln 3**	**687 tpd lime**	**baghouse**	**O_2 Monitor**	**3.0**		***3 lb/ton lime, 30-day rolling average***
2002	Vulcan	Manteno	IL-0084	MgO	coal, pet coke	rotary	Modification to kiln - Kiln 1	600 tpd lime	baghouse and double alkali packed scrubber with mist eliminator		86.4	best combustion practices	43.2 lb/t stone feed 2,159 lb/hr
2005	**Western Lime**	**Port Inland**	**MI-0383**	**CaO**	**coal, pet coke**	**preheater**	**New rotary preheater kiln - Kiln 1**	**870 tpd**	**baghouse**		**2.9**	**efficient fuel combustion and minimize excess air**	**113.2 lb/hr (based on 1.56 lb/t stone) 456 tpy**
2003	Toledo Edison	Bayshore Plant	OH-0231		NG or #2 FO		Limestone Dryer	87 gal.hr #2 FO					1.01 lb/hr 4.4 tpy
2003	**Carmeuse**	**Maple Grove**	**OH-0270**	**MgO**	**coal, coke, NG**	**rotary**	**Modification to restart an idled facility - two kilns**	**650 tpd**	**Baghouse**		**10.0**	**No control technologies for NOx, SO2, CO, or VOC were determined to be cost effective.**	**270.83 lb/hr 1,186.23 tpy, 12-month avg limits are per kiln**
2004	Graymont	Pleasant Gap	PA-0241	CaO	coal, pet coke	preheater	New preheater kiln - Kiln 6	1200 tpd	*Baghouse*	SO_2, NO_X and CO CEMS	6.0		1,461 lb/hr *1,314 tpy, 12-month avg*
2004	Graymont	Pleasant Gap	PA-0241	CaO	coal, pet coke	rotary	New rotary kiln - Kiln 7	1050 tpd	Baghouse and caustic scrubber meeting 93%CE		6.0		1,800 lb/hr 1,150 tpy, 12-month avg
2003	**Austin White**	**McNeil**	**TX-0452**	**CaO**	**coal, coke, NG**		**Modification to increase production capacity - Kiln 1 and 2**	**240 tpd**	**cyclone/wet scrubber**		**4.2**		**44.1 lb/hr 181.8 tpy**
2003	**Austin White**	**McNeil**	**TX-0452**	**CaO**	**coal, coke, NG**		***Modification to increase production capacity - Kiln 3***	**650 tpd**	***cyclone/Baghouse***		**1.2**		***38.3 lb/hr* 137.9 tpy**
2006	Graymont	Superior	WI-0233	CaO	coal, pet coke	preheater	New kiln - Kiln 5	650 tpd lime	Baghouse		1.56	Good combustion practices / optimization and assure compliance with the BACT emission limits - including monitoring and control of oxygen concentration	1.56 lb/t, 24-hr avg 84.2 lb/h, 3-hr avg
2010	**Mississippi Lime**	**Prairie du Rocher**	**IL**	**CaO**	**coal, coke**	**preheater**	**New preheater rotary kilns (2)**	**2,400 tpd lime for two kilns**	**Baghouse**	**SO_2, NO_X and CO CEMS**	**2.5**	**Good combustion practices to minimize formation of CO**	**2.5 lb/t lime, 24-hour avg 125 lb/hr 547.5 tpy**
2010	Vulcan	Monteno	IL	MgO	coal, pet coke	preheater	Modification to install spray dryer absorber, shorten the length of the kiln, and install a pre-heater tower - facility has been idled	600 tpd lime	spray dryer absorber and Baghouse	SO_2, NO_X and CO CEMS	24.8	Good combustion practices to minimize formation of CO	11.48 lb/hr, 24-hr avg 2,716.0 tpy
2010	**Synergy Management**	**White County**	***IN***	***MgO***	**coal, pet coke**	**preheater**	**New preheater rotary kilns (2)**	**900 tpd lime each**	**Baghouse**	**none**	**2.5**	**Good combustion practices to minimize formation of CO**	**2.5 lb/t lime, 3-hr avg 94 lb/hr, 3-hr avg**
2007	Mississippi Lime	Verona	KY	CaO	coal, pet coke	preheater, CFB	New rotary kilns (2)	840 tpd lime each	Baghouse			proper design and operation	52.5 lbs/hr, 1-hr avg 3.0 lb/t lime, 30-day avg
2007	**Graymont**	**Cricket Mountain**	**UT**	**both**	**coal, pet coke propane / diesel start up**	**preheater**	**New preheater kiln - Kiln 5**	**1,400 tpd lime**	**Baghouse**	**SO_2 CEMS fuel dependent**	**4.0**		**233.0 lbs/hour and no greater than 4.00 lb/ton lime**
2006	Dakota Coal	Frannie Plant		CaO	coal, pet coke	rotary	Modification to kiln (increase SO_2 limit from 9 to 12 lb/hr and related new coal mill installation)	500 tpd lime	Baghouse	NO_x CEMS	1.0		21.0 lb/hr 92.0 TPY

[redacted]

Table 3 EPA RBLC Database - Kiln NSR Projects 2000 - Current

Year	Company	Facility	RBLC	Product	Fuel	Design	Project Description	Production Rate	Add-On Controls	Pollutant	Normalized PM (lb/t lime produced)	PM BACT	PM Limit / Emission Factor
2009	Graymont	Superior	WI-0250	CaO	coal, pet coke	preheater	Modification to Kiln 5	650 tpd lime	Baghouse	Total PM (and PM10)	0.30	high organic content stone is a limestone containing 0.05wt% organic carbon content or higher. good operating practices in the use of a preheater type rotary kiln with a high temperature / membrane fabric filter Baghouse that achieves an average outlet concentration of not more than 0.010 gr/dscf (for filterable non-condensible particulate matter).	0.1500 lbs/tsf (stone), firing low organic stone 0.1000 lb/hr, lbs/tsf (stone), front half only (BACT) - 0.010 gr/dscf
2009	Graymont	Superior	WI-0250	CaO	coal, pet coke	preheater	Modification to Kiln 5	650 tpd lime	Baghouse	Total PM (and PM10)	0.92	high organic content stone is a limestone containing 0.05wt% organic carbon content or higher. good operating practices in the use of a preheater type rotary kiln with a high temperature / membrane fabric filter Baghouse that achieves an average outlet concentration of not more than 0.010 gr/dscf (for filterable non-condensible particulate matter).	0.4600 lbs/tsf (stone), firing high organic stone 0.1000 lb/hr, lbs/tsf (stone), front half only (BACT) - 0.010 gr/dscf
2005	Chemical Lime	O'Neal Plant	AL-0220	CaO	coal	preheater	Modificatioo to existing kiln 1	1500 tpd lime	Baghouse	0.24	0.24	Baghouse	0.014 gr/dscf, 3-hr avg 0.12 lb/t stone, 3-hr avg 15 lb/hr, 3-hr avg
2005	Chemical Lime	O'Neal Plant	AL-0220	CaO	coal	preheater	New preheater rotary kiln 2	1500 tpd lime	Baghouse	0.2	0.20	Baghouse	0.01 gr/dscf, 3-hr avg 0.1 lb/t stone, 3-hr avg 12.5 lb/hr, 3-hr avg
2004	Graymont	Pleasant Gap	PA-0241	CaO	coal, pet coke	preheater	New preheater kiln - Kiln 6	1200 tpd	Baghouse	PM	0.20	fabric filters	0.1 lb/t stone
2004	Graymont	Pleasant Gap	PA-0241	CaO	coal, pet coke	preheater	New preheater kiln - Kiln 6	1200 tpd	Baghouse	FPM10	3.50	fabric filters	0.01 gr/dscf 0.1 lb/t stone 767 tpy
2004	Graymont	Pleasant Gap	PA-0241	CaO	coal, pet coke	rotary	New rotary kiln - Kiln 7	1050 tpd	Baghouse and caustic scrubber meeting 93%CE	PM	0.20	fabric filters	0.1 lb/t stone 1 gr/dscf
2003	Austin White	McNeil	TX-0452	CaO	coal, coke, NG		Modification to increase production capacity - Kiln 1 and 2	240 tpd	cyclone/wet scrubber	PM	4.40	cyclone/wet scrubber	46.7 lb/hr 192.7 tpy
2003	Austin White	McNeil	TX-0452	CaO	coal, coke, NG		Modification to increase production capacity - Kiln 3	650 tpd	cyclone/Baghouse	PM	0.40	cyclone/Baghouse	13.2 lb/hr 47.5 tpy
2003	Carmeuse	Maple Grove	OH-0270	MgO	coal, coke, NG	rotary	Modification to restart an idled facility - two kilns	650 tpd	Baghouse	Opacity		use of a Baghouse with a maximum outlet grain loading of 0.021 gr/dscf	15% opacity, 6-min avg
2003	Carmeuse	Maple Grove	OH-0270	MgO	coal, coke, NG	rotary	Modification to restart an idled facility - two kilns	650 tpd	Baghouse	PM10	0.53	use of a Baghouse with a maximum outlet grain loading of 0.021 gr/dscf (99% CE) Method 5, 201 or 201A shall be conducted for grain loading and PM 10 emissions.	0.5 lb/t 14.23 lb/hr 62.33 tpy
2006	Graymont	Superior	WI-0233	CaO	coal, pet coke	preheater	New kiln - Kiln 5	650 tpd lime	Baghouse	Total PM	0.20		5.4 lb/hr, 3-hr avg (including M 202 back half) 0.1 lb/t, 3-hr avg (including M 202 back half)
2006	Graymont	Superior	WI-0233	CaO	coal, pet coke	preheater	New kiln - Kiln 5	650 tpd lime	Baghouse	FPM			0.1 lb/hr, 3-hr avg (front half only) 0.1 lb/t, 3-hr avg (front half only) 0.012 gr/dscf (front half only)
2005	Arkansas Lime	Batesville	AR-0082	CaO	coal, coke, NG	preheater	New rotary preheater kiln - Kiln 3	687 tpd lime	Baghouse	PM10	0.20	BAGHOUSE (99% CE)	0.1 lb/t stone (Method 5 and 202)
2002	Vulcan	Manteno	IL-0084	MgO	coal, pet coke	rotary	Modification to kiln - Kiln 1	600 tpd lime	Baghouse and double alkali packed scrubber with mist eliminator	PM	0.27	BAGHOUSE (99.8% CE)	0.134 lb/t stone 6.7 lb/hr
2005	Western Lime	Port Inland	MI-0383	CaO	#2 FO, propane, coal, pet coke	preheater	New rotary preheater kiln - Kiln 1	870 tpd	Baghouse	FPM10	0.18	FABRIC FILTERS AND USE OF PROPANE OR NO. 2 OIL WITH NO STONE FEED FOR STARTUP. (99% CE) BYPASS OF BAGHOUSE DURING STARTUP WITH NO STONE FEED IS ALLOWED.	7.5 lb/hr (based on 0.1 lb/t stone) 29.2 tpy, 12-month avg

Table 3 EPA RBLC Database - Kiln NSR Projects 2000 - Current

Year	Company	Facility	RBLC	Product	Fuel	Design	Project Description	Production Rate	Add-On Controls	Pollutant	Normalized PM (lb/t lime produced)	PM BACT	PM Limit / Emission Factor
2010	Mississippi Lime	Prairie du Rocher	IL	CaO	coal, coke	preheater	New preheater rotary kilns (2)	2400 tpd lime for two kilns	Baghouse	FPM	0.14	Baghouse	0.14 lb/t lime, 3-hr avg 7.1 lb/hr 31.0 tpy
2010	Mississippi Lime	Prairie du Rocher	IL	CaO	coal, coke	preheater	New preheater rotary kilns (2)	2400 tpd lime for two kilns	Baghouse	Total PM10	0.19	Baghouse	0.18 lb/t lime, 3-hr avg 8.8 lb/hr 42.2 tpy
2010	Mississippi Lime	Prairie du Rocher	IL	CaO	coal, coke	preheater	New preheater rotary kilns (2)	2400 tpd lime for two kilns	Baghouse	Total PM2.5	0.10	Baghouse	0.105 lb/t lime, 3-hr avg 5.24 lb/hr 22.95 tpy
2010	Vulcan	Monteno	IL	MgO	coal, pet coke	preheater	Modification to install spray dryer absorber, shorten the length of the kiln, and install a pre-heater tower - facility has been idled	600 tpd lime	spray dryer absorber and Baghouse	FPM	0.20		0.10 lb/t stone, 3-hr avg
2010	Vulcan	Monteno	IL	MgO	coal, pet coke	preheater	Modification to install spray dryer absorber, shorten the length of the kiln, and install a pre-heater tower - facility has been idled	600 tpd lime	spray dryer absorber and Baghouse	Total PM10	0.49		0.246 lb/ton stone, 3-hr avg
2010	Synergy Management	White County	IN	MgO	coal, pet coke	preheater	New preheater rotary kilns (2)	900 tpd lime each	Baghouse	FPM	0.15		0.01 gr/dscf 0.15 lb/t, 3-hr avg (filterable)
2010	Synergy Management	White County	IN	MgO	coal, pet coke	preheater	New preheater rotary kilns (2)	900 tpd lime each	Baghouse	FPM10	0.20		0.01 gr/dscf 0.20 lb/t lime], 3-hr avg (filterable)
2010	Synergy Management	White County	IN	MgO	coal, pet coke	preheater	New preheater rotary kilns (2)	900 tpd lime each	Baghouse	PM and PM2.5/PM-10 (filterable)	0.15		0.01 gr/dscf 0.15 lb/t, 3-hr avg (filterable)
2010	Synergy Management	White County	IN	MgO	coal, pet coke	preheater	New preheater rotary kilns (2)	900 tpd lime each	Baghouse	PM2.5/PM-10 (filterable and condensible)	0.20		0.01 gr/dscf 0.20 lb/t lime], 3-hr avg (filterable and condensible)
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	MgO	coal, pet coke, NG	preheater	New rotary kiln - Kiln 7	900 tpd lime 37.5 tph lime	Baghouse	FPM10	0.23	Baghouse with 100% capture efficiency	0.1 lb/t stone 37.80 tpy, 12-month avg
2007	Mississippi Lime	Verona		CaO	coal, pet coke	preheater, CFB	New rotary kilns (2)	840 tpd lime each	Baghouse	FPM / FPM10		Baghouse	0.2 lb/ton lime, 24-hr avg
2007	Graymont	Cricket Mountain	UT	both	coal, pet coke propane / diesel start up	preheater	New preheater kiln - Kiln 5	1400 tpd lime	Baghouse	FPM		Baghouse	0.020 gr/dscf 0.10 lb/t stone
2007	Graymont	Cricket Mountain	UT	both	coal, pet coke propane / diesel start up	preheater	Modify kiln 1 to fire pet coke and replace wet scrubber with a Baghouse	600 tpd lime	Baghouse	FPM			0.020 gr/dscf 0.12 lb/t stone
2006	Dakota Coal	Frannie Plant		CaO	coal, pet coke	rotary	Modification to kiln (increase SO_2 limit from 9 to 12 lb/hr and related new coal mill installation)	500 tpd lime	Baghouse	PM	0.17	Baghouse	0.01 gr/dscf 3.5 lb/hr 15.3 tpy

Table 4 EPA RBLC Database - Kiln NSR Projects 2000 - Current

Year	Company	Facility	RBLC	Product	Fuel	Design	Project Description	Production Rate	Add-On Controls	Continuous Monitoring	Normalized NO_X (lb/t lime produced)	NO_X BACT	NO_X Limit / Emission Factor
2010	Mississippi Lime	Prairie du Rocher	IL	CaO	coal, coke	preheater	New preheater rotary kilns (2)	2400 tpd lime for two kilns	Baghouse	SO_2, NO_X and CO CEMS	3.50	design of the kilns and low excess air and good combustion practices	3.5 lbs/ton lime, daily 24-hr avg 175.0 lb/hr 3-hr avg each 766.5 tpy each
2010	Vulcan	Monteno	IL	MgO	coal, pet coke	preheater	Modification to install spray dryer absorber, shorten the length of the kiln, and install a pre-heater tower - facility has been idled	600 tpd lime	spray dryer absorber and Baghouse	SO_2, NO_X and CO CEMS	8.64	design of the kiln and low excess air and good combustion practices	4.5 lb/t stone feed 24-hr avg 4.0 lb/t stone feed 30-day avg or such lower limits (as low as 3.5 and 3.0 lbs/ton, respectively), as may be set based on actual kiln OR minimize NOx by maintaining the O2 in the flue gases at no more than 1.25 % by volume, 1-hr avg and 243.0 lb/hr 3-hr avg 946.0 tpy
2010	Synergy Management	White County	IN	MgO	coal, pet coke	preheater	New preheater rotary kilns (2)	900 tpd lime each	Baghouse	none	3.49	good combustion practices and use a preheater type rotary kiln	3.5 lb/ton lime 3-hr avg 131 lb/hr 3-hr avg
2009	Graymont	Superior	WI-0250	CaO	coal, pet coke	preheater	Modification to Kiln S	650 tpd lime	Baghouse	SO_2, NO_X and CO CEMS	3.65	use of a preheater type rotary kiln and (b) good operating practices / optimization which minimize nitrogen oxide emissions.	1.83 lbs/tsf (stone) 24-hr rolling average (excluding startup and shutdown), 0.7 lbs/MMBTU (monthly average) 98.8 lbs/hr (3 hour average).
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	MgO	coal, pet coke, NG	preheater	New rotary kiln - Kiln 7	900 tpd lime 37.5 tph lime	Baghouse		4.10	no add-on controls found cost effective	4.1 lbs/t lime 673.43 tpy 12-month rolling
2007	Mississippi Lime	Verona		CaO	coal, pet coke	preheater, CFB	New rotary kilns (2)	840 tpd lime each	Baghouse		3.10	proper kiln design and operation	108.5 lbs/hr annual avg 4.0 lb/t lime 30-day avg
2007	Graymont	Cricket Mountain	UT	both	coal, pet coke propane / diesel start up	preheater	New preheater kiln - Kiln 5	1400 tpd lime	Baghouse	SO_2 CEMS fuel dependent	3.60	Efficient combustion practices, minimization of fuel consumption and excess air for the combustion process.	210.0 lb/hr 3.60 lb/ton lime
2007	Graymont	Cricket Mountain	UT	both	coal, pet coke propane / diesel start up	preheater	Modify kiln 1 to fire pet coke and replace wet scrubber with a Baghouse	600 tpd lime	Baghouse	SO_2 CEMS fuel dependent	3.60	NA	90.0 lb/hr TV limit
2007	Graymont	Pleasant Gap	Minor NSR	CaO		preheater	Modification to permit for new preheater rotary kiln - Kiln 7		Baghouse and semi wet caustic scrubber				
2006	Chemical Lime	Clifton	PSD TX-441M1	CaO	petcoke, coal, natural gas	vertical	Petcoke firing - Kiln 3	25 ton/hr lime	Wet scrubber	none	3.00		75 lb/hr limit
2006	Graymont	Superior	WI-0233	CaO	coal, pet coke	preheater	New kiln - Kiln 5	650 tpd lime	Baghouse		3.65	Good combustion practices, optimization and tuning and analysis to minimize NOx, - monitoring of O_2 concentration exiting review of system for improvements	98.8 lb/hr 3-hr avg 1.83 lb/t stone feed 24-hr avg (approx 0.9 lb/t lime)
2006	Graymont	Pilot Peak Plant	NV-0040	CaO	coal	preheater	Modification to Kiln 1 [increase fuel S content]	600 tpd lime	Baghouse	SO_2 CEMS	NA	NA	NA
2006	Graymont	Pilot Peak Plant	NV-0040	CaO	coal	preheater	Modification to Kiln 2 [increase fuel S content]	800 tpd lime	Baghouse	SO_2 CEMS	NA	NA	NA
2006	Graymont	Pilot Peak Plant	NV-0040	CaO	coal	preheater	Modification to Kiln 3 [increase fuel S content]	1200 tpd lime	Baghouse	SO_2 CEMS	NA	NA	NA
2006	Dakota Coal	Frannie Plant		CaO	coal, pet coke	rotary	Modification to kiln (increase SO_2 limit from 9 to 12 lb/hr and related new coal mill installation)	500 tpd lime	Baghouse	NO_x CEMS	4.08		85 lb/hr 24-block avg 372.3 tpy
2005	Chemical Lime	O'Neal Plant	AL-0220	CaO	coal	preheater	New preheater rotary kiln and modification to existing kiln [same limits for both]	1500 tpd lime		SO_2 CEMS	NA	NA	NA
2005	Arkansas Lime	Batesville	AR-0082	CaO	coal, coke, NG	preheater	New rotary preheater kiln - Kiln 3	687 tpd lime	Baghouse	O_2 Monitor	3.18	proper kiln design and operation	3.5 lb/t of lime 30-day rolling average 100.2 lb/hr 399.3 tpy
2005	Western Lime	Port Inland	MI-0383	CaO	#2 FO, propane, coal, pet coke	preheater	New rotary preheater kiln - Kiln 1	870 tpd	Baghouse	NO_x CEMS	3.35	Low NOx burners	132.6 lb/hr 24-hour rolling average as determined each hour by CEMS 532 tpy 12-month rolling (hourly limit was based upon 1.83 pounds per ton of stone feed)
2004	Graymont	Pleasant Gap	PA-0241	CaO	coal, pet coke	preheater	New preheater kiln - Kiln 6	1200 tpd	Baghouse	SO_2 CEMS	3.50	NA	205 lb/hr 30-day avg 767 tpy 12-month rolling limit to be modified

Table 4 EPA RBLC Database - Kiln NSR Projects 2000 - Current

Year	Company	Facility	RBLC	Product	Fuel	Design	Project Description	Production Rate	Add-On Controls	Continuous Monitoring	Normalized NO_X (lb/t lime produced)	NO_X BACT	NO_X Limit / Emission Factor
2004	Graymont	Pleasant Gap	PA-0241	CaO	coal, pet coke	rotary	New rotary kiln - Kiln 7	1050 tpd	Baghouse and caustic scrubber meeting 93%CE	SO_2 CEMS	3.70	NA	179 lb/hr 30- day avg 709 tpy 12-month rolling limit to be modified
2003	Carmeuse	Maple Grove	OH-0270	MgO	coal, coke, NG	rotary	Modification to restart an idled facility - Kiln 2	650 tpd	Baghouse		45.60		45.6 lb/t lime 1234.9 lb/hr 5408.9 tpy
2003	Austin White	McNeil	TX-0452	CaO	coal, coke, NG		*Modification to increase production capacity - Kiln 1 and 2*	240 tpd	cyclone/wet scrubber		9.98		106.1 lb/hr 437.3 tpy
2003	Austin White	McNeil	TX-0452	CaO	coal, coke, NG		Modification to increase production capacity - Kiln 3	650 tpd	cyclone/Baghouse		3.59		118.3 lb/hr 425.7 tpy
2003	Toledo Edison	Bayshore Plant	OH-0231		NG or #2 FO		Limestone Dryer	87 gal.hr #2 FO					1.74 lb/hr 7.63 tpy
2002	Vulcan	Manteno	IL-0084	MgO	coal, pet coke	rotary	Modification to kiln - Kiln 1	600 tpd lime	Baghouse and double alkali packed scrubber with mist eliminator		9.70	best combustion practices and/or *low excess air (less than 1.0 % oxygen)*	4.5 lb/t stone feed 242.5 lb/hr
2000	Arkansas Lime	Batesville	AR-0034	CaO	Only NG for Kiln 2, Coke/Coal are limited	rotary	New rotary kiln - Kiln 2	600 tpd	Baghouse		3.65		3.65 lb/t lime 399.3 tpy
2000	*Graymont*	Broadwater County	MT-0020	CaO	coal	rotary	Modification to increase NOx emissions rate	187,500 tpy lime	Baghouse		4.67	good combustion practices	100 lb/hr

Table 5 EPA RBLC Database - Kiln NSR Projects 2000 - Current

Year	Company	Facility	RBLC	Product	Fuel	Design	Project Description	Production Rate	Add-On Controls	Continuous Monitoring	Normalized SO_2 (lb/t lime produced)	SO_2 BACT	SO_2 Limit / Emission Factor	Sulfuric Acid Mist Limit / Emission Factor
2010	Mississippi Lime	Prairie du Rocher	IL	CaO	coal, coke	preheater	New preheater rotary kilns (2)	2400 tpd lime for two kilns	Baghouse	SO_2, NO_X and CO CEMS	0.65	Inherent dry scrubbing	0.645 lbs/ton lime, daily 24-hr avg 32.3 lb/hr 3-hr avg each 141.5 tpy each	
2010	Vulcan	Monteno	IL	MgO	coal, pet coke	preheater	Modification to install spray dryer absorber, shorten the length of the kiln, and install a pre-heater tower - facility has been idled	600 tpd lime	spray dryer absorber and Baghouse	SO_2, NO_X and CO CEMS	4.32	spray dryer absorber and Baghouse	2.2 lb/t stone feed 3-hr avg 2.0 lb/t stone feed, 30-day avg or such lower limits (as low as 1.8 and 1.5 lb/t stone feed, respectively), as may be set based on actual kiln emissions 119 lb/hr 3-hr avg 119 lb/hr 24-hr avg 473.0 tpy	
2010	Synergy Management	White County	IN	MgO	coal, pet coke	preheater	New preheater rotary kilns (2)	900 tpd lime each	Baghouse	none	2.00	proper kiln design and operation (inherent scrubbing)	2.0 lb/ton lime 3-hr avg 6 lb/mmbtu 75.0 lb/hr 3-hr avg	
2009	Graymont	Superior	WI-0250	CaO	coal, pet coke	preheater	Modification to Kiln 5	650 tpd lime	Baghouse	SO_2, NO_X and CO CEMS	1.24	use of a preheater type rotary kiln with a high temperature / membrane fabric filter Baghouse that achieves at least 92% collection / retention of potential sulfur dioxide emissions, and (b) a fuel sulfur content limit of 2.0% (by weight)	0.62 lbs/tsf (stone), 24-hr rolling avg 33.7 lbs/hr 3-hr rolling avg	1.5000 lb/hr sulfuric acid mist
2008	Martin Marietta Magnesia Specialties	Sandusky	OH-0321	MgO	coal, pet coke, NG	preheater	New rotary kiln - Kiln 7	900 tpd lime 37.5 tph lime	Baghouse		1.70	no add-on controls found cost effective - Fuel sulfur content limit back calculated	1.7 lbs/t lime 279.23 tpy 12-month rolling	
2007	Mississippi Lime	Verona	KY	CaO	coal, pet coke	preheater, CFB	New rotary kilns (2)	840 tpd lime each	Baghouse		0.35	CFB, fuel sulfur lower than tested value	12.25 lb/hr 3-hr avg 0.35 lb/t lime 30-day avg	
2007	Graymont	Cricket Mountain	UT	both	coal, pet coke propane / diesel start up	preheater	New preheater kiln - Kiln 5	1400 tpd lime	Baghouse	SO_2 CEMS fuel dependent	1.01	inherent dry scrubbing SO_2 CEMS required to burn coal with a S content >1.0 lb/mmBtu	59.0 lb/hr 1.01 lb/ton lime	
2007	Graymont	Cricket Mountain	UT	both	coal, pet coke propane / diesel start up	preheater	Modify kiln 1 to fire pet coke and replace wet scrubber with a Baghouse	600 tpd lime	Baghouse	SO_2 CEMS fuel dependent	0.90	inherent dry scrubbing SO_2 CEMS required to burn coal with a S content >1.0 lb/mmBtu	22.4 lb/hr TV Limit	
2007	Graymont	Pleasant Gap	Minor NSR	CaO		preheater	Modification to permit for new preheater rotary kiln - Kiln 7		Baghouse and semi wet caustic scrubber					
2006	Graymont	Superior	WI-0233	CaO	coal, pet coke	preheater	New kiln - Kiln 5	650 tpd lime	Baghouse		1.24	2% sulfur in fuel - assumes 92% CE from inherent scrubbing of gas in Baghouse	0.62 lb/t stone feed 24-hr avg 33.7 lb/hr 3-hr avg	1.5 lb/hr sulfuric acid mis Acid gas HAPs controlled by reaction with lime in kiln, preheater and Baghouse (92% CE)
2006	Graymont	Pilot Peak Plant	NV-0040	CaO	coal	preheater	Modification to Kiln 1 (increase fuel S content)	600 tpd lime	Baghouse	SO_2 CEMS	0.56	3% sulfur	14 lb/hr 3-hr avg	
2006	Graymont	Pilot Peak Plant	NV-0040	CaO	coal	preheater	Modification to Kiln 2 (increase fuel S content)	800 tpd lime	Baghouse	SO_2 CEMS	0.63	3% sulfur	21 lb/hr 3-hr avg	
2006	Graymont	Pilot Peak Plant	NV-0040	CaO	coal	preheater	Modification to Kiln 3 (increase fuel S content)	1200 tpd lime	Baghouse	SO_2 CEMS	0.67	3% sulfur	33.6 lb/hr 3-hr avg	
2006	Dakota Coal	Frannie Plant		CaO	coal, pet coke	rotary	Modification to kiln (increase SO_2 limit from 9 to 12 lb/hr and related new coal mill installation)	500 tpd lime	Baghouse	NO_x CEMS	0.58	inherent scrubbing	12 lb/hr 52.6 tpy	
2005	Chemical Lime	O'Neal Plant	AL-0220	CaO	coal	preheater	New preheater rotary kiln and modification to existing kiln (same limits for both)	1500 tpd lime		SO_2 CEMS	1.40	not specified	2.05 lb/t lime 24-hr avg 1.4 lb/t 12-month avg 128.12 lb/hr 3-hr avg 383.25 tpy 12-month rolling	
2005	Arkansas Lime	Batesville	AR-0082	CaO	coal, coke, NG	preheater	New rotary preheater kiln - Kiln 3	687 tpd lime	Baghouse	O_2 Monitor	1.13	dry scrubbing by lime prod. 92%CE 4%S daily avg 3%S 30-day rolling avg	44.8 lb/hr 141.6 tpy	
2005	Western Lime	Port Inland	MI-0383	CaO	#2 FO, propane, coal, pet coke	preheater	New rotary preheater kiln - Kiln 1	870 tpd	Baghouse	NO_x CEMS	1.52	2.5% sulfur in fuel monthly average	60.2 lb/hr monthly basis 242 tpy 12-month rolling (hourly limit was based upon 0.83 pounds per ton of stone feed)	

Table 5 EPA RBLC Database - Kiln NSR Projects 2000 - Current

Year	Company	Facility	RBLC	Product	Fuel	Design	Project Description	Production Rate	Add-On Controls	Continuous Monitoring	Normalized SO_2 (lb/t lime *produced)*	SO_2 BACT	SO_2 Limit / Emission Factor	Sulfuric Acid Mist Limit / Emission Factor
2004	**Graymont**	**Pleasant Gap**	PA-0241	CaO	coal, pet coke	preheater	New preheater kiln - Kiln 6	1200 tpd	Baghouse	SO_2 CEMS	2.61	annual average fuel sulfur content of 2%	305 lb/hr 3-hr block avg 571 tpy 12-month rolling 500 ppm 1-hr avg	
2004	**Graymont**	**Pleasant Gap**	PA-0241	CaO	coal, pet coke	rotary	New rotary kiln - Kiln 7	1050 tpd	Baghouse and caustic scrubber meeting 93%CE	SO_2 CEMS	1.11	scrubber and FO limit of 0.5%S annual average fuel sulfur content of 3%	92.83 lb/hr 3-hr block avg 213 tpy 12-month rolling 500 ppm 1-hr avg	
2003	**Carmeuse**	**Maple Grove**	OH-0270	MgO	coal, coke, NG	rotary	Modification to restart an idled facility - Kiln 2	650 tpd	Baghouse		?	coal 5.5%S and coke 6.5%S assumes 50% CE from inherent scrubbing	34 lb/t stone feed 1,102 lb/hr 4826.7998 tpy	
2003	**Austin White**	**McNeil**	TX-0452	CaO	coal, coke, NG		Modification to increase production capacity - Kiln 1 and 2	240 tpd	cyclone/wet scrubber		11.08		117.8 lb/hr 485.5 tpy	
2003	**Austin White**	**McNeil**	TX-0452	CaO	coal, coke, NG		Modification to increase production capacity - Kiln 3	650 tpd	cyclone/Baghouse		0.86		24.8 lb/hr 102.5 tpy	
2003	**Toledo Edison**	**Bayshore Plant**	OH-0231		NG or #2 FO		Limestone Dryer	87 gal.hr #2 FO					4.83 lb/hr 21.15 tpy	
2002	**Vulcan**	**Manteno**	IL-0084	MgO	coal, pet coke	rotary	Modification to kiln - Kiln 1	600 tpd lime	Baghouse and double alkali packed scrubber with mist eliminator		5.52	Baghouse and double alkali packed scrubber with mist eliminator 4% fuel sulfur limit total CE estimated 86%	2.76 lb/t stone feed 138 lb/hr 3-hr avg 118 lb/hr 24-hr avg 2,825 lb/day	
2000	**Arkansas Lime**	**Batesville**	AR-0034	CaO	Only NG for Kiln 2, Coke/Coal are limited	rotary	New rotary kiln - Kiln 2	600 tpd	Baghouse		2.07	4%S daily avg 3%S 30-day rolling avg	2.07 lb/t lime 227.0 tpy	
2000	**Graymont**	**Broadwater County**	MT-0020	CaO	coal	rotary	Modification to increase NOx emissions rate	187,500 tpy lime	Baghouse		NA	NA	NA	

APPENDIX F

ECONOMIC ANALYSES

Table F-1. Capital Costs: Selective Catalytic Reduction (SCR) NO$_x$ Control for Lime Kiln

Item	Cost	Basis
Direct Costs		
Purchased Equipment	$1,000,000	EC
Instrumentation	$100,000	10% of EC
Sales Tax	$60,000	6% of EC
Freight	$50,000	5% of EC
Subtotal: Purchase Equipment	$1,210,000	PEC
Installation	$200,000	
Subtotal: Installation	$200,000	
Total Direct Costs	$1,410,000	TDC
Indirect Costs		
Initial Fill	$133,548	14-day supply
General Facilities	$60,500	5% of PEC
Engineering/Home Office Fees	$121,000	10% of PEC
Process Contingency	$60,500	5% of PEC
Project Contingency	$211,500	15% of TDC
Total Indirect Costs	$393,000	TIC
Plant Costs	$1,803,000	TPC= TDC + TIC
Preproduction Costs	$36,060	2% of TPC
Inventory Capital	$7,210	vol of reagent × cost of reagent
Total Capital Investment	$1,846,270	TCI

Sources: OAQPS, 2013.
Jacksonville Lime, 2013.
ECT, 2013.

Table F-2. Annual Operaing Costs: Selective Catalytic Reduction (SCR) NO_x Control for Lime Kiln

Item	Cost	Basis
Maintenance	$27,694	1.5% of TCI
Reheating with Natural Gas	Data Used	Unit
SCR Outlet Temperature	725	*°F*
Post-Baghous Air Flow	23,500	*acfm*
Post-Baghouse Temperature	284	*°F*
Air Flow in SCR	37,429	*acfm*
Specific Heat (Air)	6.85	*BTU/lb-mole °F*
Heat Neeed for Reheating	12.6	*MMBTU/hr*
Price of Natural Gas	7.70	*$/MMBtu*
Reheating Cost of Natural Gas	$828,973	357 days per year operation
Aqueous Ammonia (NH_3) Costs	Data Used	Unit
Stoichiometric Ratio	1.05	mole NH_3 to mol NO_x
MW of Ammonia	17.03	lb/lb-mol
MW of NO_x	46.01	lb/lb-mol (NO_2)
Density of Ammonia	7.51	lb/gal
Price of Ammonia	$458	per ton
	$1.72	per gal
Mass of Ammonia Needed	67.0	ton/yr
Mass Flow of 19% Ammonia	352.5	ton/yr
Volume of Ammonia	93,881	gal/yr
Cost of Ammonia	$161,476	
Electricity		Not available
Catalyst Costs		Not available
Capital Recovery	$174,275	20-year life, 7% interest
TOTAL ANNUAL COSTS	$1,192,417	
NO_x Emissions (tpy) Uncontrolled	172.3	Per kiln
NO_x Emissions (tpy) Removed	120.6	70% Control Efficiency
Cost Effectiveness ($/ton of NO_x removed)	**$9,884**	

Sources: OAQPS, 2013.
Jacksonville Lime, 2013.
ECT, 2013.

Table F-3. Partial Economic Analysis: Selective Non-Catalytic Reduction (SNCR) NO_x Control for Lime Kilns

Parameter		Value	Unit	Basis
Control Equipment Outlet Temperature		1,850	*°F*	Average Operating Temperature (1600-2100 °F), EPA Factsheet (http:www.epa.gov/ttn/calc/dir1/fsncr.pdf)
Air Flow		23,500	*acfm*	Vertical Kiln Design
Exhaust Temperature		294	*°F*	Vertical Kiln Design
Inlet Air Flow to SNCR		71,996	*acfm*	Estimated based on Required SNCR Temperature
Density of Air		0.0026	*lb-mole/scf*	Constant
Specific Heat (Air)		6.85	*Btu/lb-mole °F*	Constant
Fuel Reheating Need Per Kiln		27.5	*MMBtu/hr*	(Std. Temp, R / Exhaust Temp, R) x Air Density x Specific Heat x (Op. Temp, F - Exhaust Temp, F) / 1E6 x Flowrate x 60
Natural Gas Costs	High	9.57	*$/MMBtu*	EIA Natural Gas Monthly, 2013
(per kiln)		2,302,572	*$/yr*	
	Low	6.35	*$/MMBtu*	EIA Natural Gas Monthly, 2013
		1,527,830	*$/yr*	
	Average	7.70	*$/MMBtu*	EIA Natural Gas Monthly, 2013
	(2007-2011)	1,852,644	*$/yr*	
Uncontrolled NO_x Emissions		171.6	*ton/yr*	Based on pet coke, per kiln
NO_x Emissions from NG Combustion		11.1	*ton/yr*	94 lb/MMcf, AP-42 EF
Control Efficiency		40	*%*	Between 30 and 50%
Controlled Emissions		103.0	*ton/yr*	
Emission Reductions		79.7	*ton/yr*	
Cost Effectiveness		**23,233**	*$/ton of NOx*	Average

Sources: Jacksonville, Lime, 2013.
ECT, 2013.

Table F-4. Economic Comparison Between Natural Gas and Pet Coke as Fuel Source
NO_x Control for Lime Kilns

Parameter		Value	Unit	Basis
Natural Gas				
Natural Gas Usage		484,880,256	*ft^3/yr*	
Lime Produced		117,810	*ton/yr*	nominal
Average Heat Content		1,026	*Btu/ft^3*	
Heat Input		494,578	*MMBtu/yr*	
Natural Gas Prices	Low	6.35	*$/MMBtu*	EIA Natural Gas Monthly, 2013
	High	9.57	*$/MMBtu*	EIA Natural Gas Monthly, 2013
	Avg. 2007-2011	7.70	*$/MMBtu*	EIA Natural Gas Monthly, 2013
NO_x Emissions		14.1	*ton/yr*	AP-42 (Table 11.17-6), 0.24 lb/ton
Pet Coke				
Pet Coke Usage		18456.9	*ton/yr*	
Lime Produced		98,175	*ton/yr*	
Average Heat Content		12,400	*Btu/lb*	
Heat Input		457,731	*MMBtu/yr*	
Pet Coke Prices	Low Sulfur	2.56	*$/MMBtu*	Carmeuse, 2011/2012
	High Sulfur	2.89	*$/MMBtu*	Carmeuse, 2011/2012
	Avg. 2007-2011	2.73	*$/MMBtu*	Carmeuse, 2011/2012
NO_x Emissions		171.6	*tons*	Based on Proposed BACT
Cost Effectiveness (Incremental)		**15,780**	$/ton	Avg. NG Cost / High S Petcoke
		21,042	$/ton	High NG Cost / High S Pet Coke
		16,739	$/ton	Avg. NG Cost / Low S Pet Coke
		12,500	$/ton	Low NG Cost / Low S Pet Coke

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table F-5. Economic Comparison Between Different Sulfur Contents of Coal SO_2 Control for Lime Kilns

Parameter		Value	Unit	Basis
Coal Usage		19740.672	*ton/yr*	24 h/d, 357 d/y
Average Heat Content		12,465	*Btu/lb*	
Heat Input		492,135	*MMBTU/yr*	
Coal Prices	Low S (1.2%)	3.05	*$/MMBtu*	Carmeuse, 11/12
	High S (3%)	1.67	*$/MMBtu*	Carmeuse, 11/12
	Avg. (2007-2011)	4.31	*$/MMBtu*	EIA SEDs, 2011
SO_2 Emissions (3.0% S, 90% control)		112.5	*ton/yr*	AP-42 Table 1.1-3, 38S lb/ton
SO_2 Emissions (1.2% S, 90% control)		45.0	*ton/yr*	AP-42 Table 1.1-3, 38S lb/ton
SO_2 Emission Reductions		67.5	*ton/yr*	
Costs for 3.0% S		821,865	*$/yr*	
Costs for 1.2% S		1,501,012	*$/yr*	
Cost Difference		679,146	*$/yr*	
Cost Effectiveness (Incremental)		**10,059**	*$/ton*	

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table F-6. Economic Comparison Between Natural Gas and Pet Coke as Fuel Source
SO_2 Control for Lime Kilns

Parameter		Value	Unit	Basis
Natural Gas				
Natural Gas Usage		943	*ft^3/min/kiln*	
		484,880,256	*ft^3/yr*	*Per kiln*
Lime Produced		141,372	*ton/yr*	*Per kiln*
Average Heat Content		1,020	*Btu/ft^3*	
Annual Heat Input		494,578	*MMBtu/yr*	*Per kiln*
Natural Gas Prices	Low	6.35	*$/MMBtu*	EIA Natural Gas Monthly, 2013
	High	9.57	*$/MMBtu*	EIA Natural Gas Monthly, 2013
	2007-2011 average	7.70	*$/MMBtu*	EIA Natural Gas Monthly, 2013
SO_2 Emissions		0.08	*ton/yr*	*Based on AP-42 EF*
Pet Coke				
Pet Coke Usage		2	*ton/hr/kiln*	
		18,457	*ton/yr*	*Per kiln*
Lime Produced		117,810	*ton/yr*	*Per kiln*
Average Heat Content		15,400	*Btu/lb*	
Annual Heat Input		568,473	*MMBtu/yr*	
Pet Coke Prices	Low Sulfur	2.56	*$/MMBtu*	Carmeuse, 2011/2012
	High Sulfur	2.89	*$/MMBtu*	Carmeuse, 2011/2012
	Average	2.73	*$/MMBtu*	Carmeuse, 2011/2012
SO_2 Emissions		90.04	*ton/yr*	*Based on proposed BACT*
Cost Effectiveness (Incremental)		**25,084**	*$/ton*	Avg. NG Cost / High S Petcoke

Sources: Jacksonville Lime, 2013.
ECT, 2013.

Table F-7. Capital Costs of Wet Scrubbing SO_2 Control for Lime Kiln

Item		Cost	Basis
Direct Costs			
Purchased Equipment		$2,700,000	EC
	Instrumentation	$270,000	10% of EC
	Sales Tax	$81,000	3% of EC
	Freight	$135,000	5% of EC
	Subtotal: Purchase Equipment	$3,186,000	PEC
Installation			
	Foundations & Supports	$382,320	12% of PEC
	Handling & Erection		Included in EC
	Electrical	$31,860	1% of PEC
	Piping	$955,800	30% of PEC
	Insulation for Ductwork	$31,860	1% of PEC
	Painitng	$31,860	1% of PEC
	Subtotal: Installation	$1,433,700	
	Site Preparation		N/A
	Buildings		N/A
	Total Direct Costs	$4,619,700	TDC
Indirect Costs			
	Engineering	$254,880	8% of PEC
	Construction Fee	$95,580	3% of PEC
	Construction & Field Expenses	$318,600	10% of PEC
	Start-up	$31,860	1% of PEC
	Performance Test	$31,860	1% of PEC
	Contingency	$95,580	3% of PEC
	Total Indirect Costs	$828,360	TIC
	Total Capital Investment	$5,448,060	TCI = TDC +TIC

Sources: OAQPS, 2013.
Jacksonville Lime, 2013.
ECT, 2013.

Table F-8. Annual Operaing Costs of Wet Scrubbing SO_2 Control for Lime Kiln

Item		Cost	Basis
Direct Costs			
Labor & Materials			
Operating			0.5 hr/shift, 3 shifts/day, 357 days/yr, $16/hr
	Operator	$8,568	A
	Supervisor	$1,285	15% of A
Maintenance			0.5 hr/shift, 3 shifts/day, 357 days/yr, $16/hr
	Labor	$8,568	B
	Materials	$8,568	100% of B
	Subtotal: Labor & Materials	$26,989	C
Variable O&M			
	Electricity (Pump)	$97,384	170.15 kW x $0.0668/kW-hr x 8,568 hrs
	Limestone Slurry	$2,490	$166 ton/yr x $15/ton
	Total Direct Annual Costs	$126,863	TDC2
Indirect Costs			
	Overhead	$16,194	60% of C
	Administrative	$108,961	2% of TCI
	Property Tax	$54,481	1% of TCI
	Insurance	$54,481	1% of TCI
	Capital Recovery	$598,168	15-year life, 7% interest
	Total Direct Annual Costs	$832,284	TIC2
	TOTAL ANNUAL COSTS	$959,147	TAC = TDC2 = TIC2
SO_2 Emissions (tpy) Uncontrolled		90.04	Per kiln
SO_2 Emissions (tpy) Removed		81.03	90% Control Efficiency
Cost Effectiveness ($/ton of SO_2 removed)		**$11,837**	Incremental

Sources: OAQPS, 2013.
Jacksonville Lime, 2013.
ECT, 2013.

Table F-9. Capital Costs of Semi-wet Scrubbing SO_2 Control for Lime Kiln

Item	Cost	Basis
Direct Costs		
Purchased Equipment	$1,200,000	EC
Instrumentation	$120,000	10% of EC
Sales Tax	$36,000	3% of EC
Freight	$60,000	5% of EC
Subtotal: Purchase Equipment	$1,416,000	PEC
Installation		
Foundations & Supports	$169,920	12% of PEC
Handling & Erection	$566,400	40% of PEC
Electrical	$14,160	1% of PEC
Piping	$424,800	30% of PEC
Insulation for Ductwork	$14,160	1% of PEC
Painitng	$14,160	1% of PEC
Subtotal: Installation	$1,203,600	
Site Preparation		N/A
Buildings		N/A
Total Direct Costs	$2,619,600	TDC
Indirect Costs		
Engineering	$141,600	10% of PEC
General Facilities	$141,600	10% of PEC
Construction & Field Expenses	$141,600	10% of PEC
Start-up	$14,160	1% of PEC
Performance Test	$14,160	1% of PEC
Contingency	$42,480	3% of PEC
Total Indirect Costs	$495,600	TIC
Total Capital Investment	$3,115,200	TCI = TDC +TIC

Sources: OAQPS, 2013.
Jacksonville Lime, 2013.
ECT, 2013.

Table F-10. Annual Operaing Costs of Semi-wet Scrubbing SO_2 Control for Lime Kiln

Annual Operaing Costs: Semi-wet Scrubber for SO_2 Control - Lime Kiln

Item	Cost	Basis
<u>Direct Costs</u>		
Labor & Materials		
Operating		0.5 hr/shift, 3 shifts/day, 357 days/yr, $16/hr
Operator	$8,568	A
Supervisor	$1,285	15% of A
Maintenance		0.5 hr/shift, 3 shifts/day, 357 days/yr, $16/hr
Labor	$8,568	B
Materials	$8,568	100% of B
Subtotal: Labor & Materials	$26,989	C
Variable O&M		
Electricity (Pump)	$97,384	170.15 kW x $0.0668/kW-hr x 8,568 hrs
Hydrated Lime (Reagent)	$244,315	$131 ton/yr x $1,865/ton
Total Direct Annual Costs	$368,688	TDC2
<u>Indirect Costs</u>		
Overhead	$16,194	60% of C
Administrative	$62,304	2% of TCI
Property Tax	$31,152	1% of TCI
Insurance	$31,152	1% of TCI
Capital Recovery	$342,032	15-year life, 7% interest
Total Direct Annual Costs	$482,834	TIC2
TOTAL ANNUAL COSTS	$851,522	TAC = TDC2 = TIC2
SO_2 Emissions (tpy) Uncontrolled	90.04	Per kiln
SO_2 Emissions (tpy) Removed	81.03	90% Control Efficiency
Cost Effectiveness ($/ton of SO_2 removed)	**$10,508**	Incremental

Sources: OAQPS, 2013.
Jacksonville Lime, 2013.
ECT, 2013.

Table F-11. Partial Economic Analysis: Thermal Oxidation for CO Control for Lime Kilns

Parameter		Value	Unit	Basis
Control Equipment Outlet Temperature		1,500	*°F*	Average Operating Temperature (1600-2100 °F), EPA Factsheet (http:www.epa.gov/ttn/calc/dir1/fsncr.pdf)
Air Flow		23,500	*acfm*	Design
Exhaust Temperature		212	*°F*	Design
Inlet Air Flow to Thermal Oxidizer		68,542	*acfm*	Estimated based on Required Thermal Oxidizer Temperature
Density of Air		0.0026	*lb-mole/scf*	Constant
Specific Heat (Air)		6.85	*Btu/lb-mole °F*	Constant
Fuel Reheating Need Per Kiln		25.5	*MMBTU/hr*	(Std. Temp, R / Exhaust Temp, R) x Air Density x Specific Heat x (Op. Temp, F - Exhaust Temp, F) / 1E6 x Flowrate x 60
Natural Gas Costs (per kiln)	High	9.57	*$/MMBtu*	EIA Natural Gas Monthly, 2013
		2,138,560	*$/yr*	
	Low	6.35	*$/MMBtu*	EIA Natural Gas Monthly, 2013
		1,419,003	*$/yr*	
	Average (2007-2011)	7.70	*$/MMBtu*	EIA Natural Gas Monthly, 2013
		1,720,681	*$/yr*	
Uncontrolled CO Emissions		206.0	*tons/year*	Based on pet coke, per kiln
CO Emissions from NG Combustion		9.0	*tons/year*	84 lb/MMcf, AP-42 Table 1.4-1
Control Efficiency		90	*%*	Estimate
Controlled Emissions		20.6	*tons/year*	
Emission Reductions		194.4	*tons/year*	
Cost Effectiveness		**8,852**	*$/ton of CO*	Average
		11,002	*$/ton of CO*	High
		7,300	*$/ton of CO*	Low

Sources: Jacksonville Lime, 2013.
ECT, 2013.