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A.A. Linero, P.E.
Program Administrator
New Source Review Section
BUREAU OF AIR REGULATION
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Florida Mining Corporation – Mabel Cement Plant
Response to Request for Additional Information dated June 24, 2005
DEP File No. 1190040-001-AC (PSD-FL-356)

Dear Mr. Linero:

Please find attached a response to your request for additional information dated June 24, 2005. All of your information request items are reproduced, preserving your numbering. Responses follow each item. Numerous attachments provide further information.

I trust that this information is responsive to your request. Please contact me if further information is required to process the application.

Sincerely,

Steven C. Cullen, P.E.
Koogler & Associates

Consultant to Florida Mining Corporation

Copies to: Jim Bassett
Paul Mazak, II

1. There does not appear to be any preliminary and original engineering of the kind typically associated with a cement project that has progressed to the stage where an air permit application is submitted. Typically at this point in cement project development, there is preliminary work by an engineering and design firm if not by the actual potential suppliers such as Polysius, F.L. Smidth, KHD Humboldt Wedag, CLE, etc. Please provide design information and engineering drawings.

Response: The applicant contends that specifying a cement plant manufacturer at this time will reduce their ability to negotiate plant and engineering costs and terms. It is anticipated that design information and engineering drawings will be produced by the cement plant manufacturer.

The applicant further contends that the cement plant will be manufactured for this project by a company that has manufactured and supplied cement plants in the U.S. Currently operating plants in the U.S. are able to meet fixed emission standards, such as NSPS and NESHAP, as well as specific standards, such as BACT. Reasonable assurance for the Department arises from the fact that there a limited number of companies that produce cement plants, as indicated in your question.

In terms of air pollution control equipment, the Department has issued air construction permits for cement plants before design information and engineering drawings have been available.

The applicant is having ongoing discussions with cement plant manufacturers

2. The proposed project is virtually identical in layout, production capacity, and emission characteristics to another proposed project in Florida. Please confirm that the same emissions and assumed design make sense for the area and raw materials available where the project is planned.

Response: The proposed layout is similar to other cement plants because the process flow in each is similar. The proposed plant does not have rail access, so the plant location as initially proposed is close to the main east-west roadway, State Road 50. For this same reason, the cement silos and coal storage are in proximity to the entrance road.

The raw material and raw milling unit operations are in proximity to the current and expected mining areas. The other unit operations are logically placed between raw material input and product output operations.

The proposed production capacity is similar to three proposed cement plant projects: second kilns at existing cement plants in Alachua County, Hernando County, and Suwannee County; as well as being consistent with the permitted production capacity for the Rinker cement plant in Dade County.

The basis for production capacity includes resources in reserves and market size. The proposed project has suitable reserves to propose an approximately 1 million ton per year

clinker production rate. The projected cement needs for Central Florida, in proximity to this proposed project, are great enough to accommodate this production rate.

The proposed emissions are consistent with the Department's recent BACT determinations for Florida Rock Industries (PSD-FL-350) in Alachua County and for Rinker/Florida Crushed Stone (PSD-FL-351) in Hernando County.

The area and raw materials share enough similarities with these other projects for the layout, production capacity, and emissions characteristics to make sense.

3. The requested PM limits are 0.23 lb/ton of clinker and 0.1 lb/ton of clinker from the kiln and clinker cooler respectively. This equates to 0.33 lb/ton of clinker or roughly 0.2 lb/ton of feed. For reference, F.L. Smidth guaranteed combined kiln and cooler emissions of 0.125 lb/ton of feed through a single baghouse for the new Titan America kiln in Medley, Florida. Titan has requested lowering the limit to 0.09 lb/ton of feed. This equates to roughly 0.15 lb/ton of clinker for kiln and cooler PM emissions combined. This is less than half of the value proposed by Florida Mining Corporation. Please provide any comments regarding this issue.

Response: As described above, the proposed PM limits are based directly on very recent Department BACT determinations, with separate control devices for the kiln and clinker cooler. These are merely proposed emissions limitations. The Department will make determinations of BACT for each PSD pollutant during the permitting process.

4. It is possible to design the plant with a single stack and avoid some particulate emissions. Is such a configuration an option for this project? If not, please explain.

Response: A single stack configuration, for the kiln and clinker cooler, remains an option for this project. The choice of stack configurations will be resolved after selection of a cement plant manufacturer. If necessary, dispersion modeling will be updated to reflect any changes.

5. Will any raw materials, fuels, or products be shipped in or out by railroad? What efforts will be made to minimize truck traffic, dust emissions from vehicular traffic, and emissions from vehicular fuel combustion associated with the proposed project? Please provide a detailed discussion regarding truck traffic that will be generated from the construction and operation of the new facility.

Response: No raw materials, fuels, or products will be shipped in or out by railroad. Truck traffic will be minimized by plant location in proximity to State Road 50. Dust emissions will be minimized by paving and maintenance of travel surfaces. The use of a vacuum/sweeper truck is anticipated for the entrance road.

No specific efforts will be made to minimize emissions from vehicular fuel combustion associated with the proposed project. Fuel-based emissions from vehicle engines are

regulated by the federal government at the engine manufacturer. Also, most of the truck traffic will be vehicles operated by transportation vendors, not by trucks operated by the facility.

Truck traffic generated from the construction of the new facility will vary based on the construction phase. Such truck traffic will include the delivery of ready mixed concrete for foundations.

Truck traffic generated from the operation of the facility was discussed in detail in a section of the application form. This included emissions estimations. The discussion included trucks hauling solid fuel and raw materials (additives) in, and trucks hauling finished cement out.

It is anticipated that raw materials (limestone and overburden) from onsite will be delivered to the quarry hall by conveyor. The application also addressed this operating scenario.

6. Describe the primary fuel firing scenarios and describe the ratio of heat input at various fuel mixtures. Detail why heat input ratios might change under normal operating conditions and emissions. Provide an estimate of pollutant emissions under each scenario.

Response:

The primary fuel firing scenarios include the fuel fired through the kiln burner to be pulverized coal or a mixture of coal and petroleum coke. The fuel fired through the calciner burner will typically be pulverized coal, pulverized petroleum coke, or a mixture of the two.

In general the ratio of the heat input between the kiln and calciner is about 40% of the heat value fired at the kiln burner and about 60% of the heat value fired at the calciner burner. The heat input ratio between burners is somewhat independent of fuel mixtures and operating conditions.

The heat input ratio of various fuel mixtures can vary. Typically, the kiln burner will burn coal at 100%, but may burn a mixture of about 30% coke and 70% coal. Typically, the calciner burner will burn coal at 100%, but may burn a mixture of about 30% coke and 70% coal, or other fuels in various combinations with or without coal. Other fuels described in the application include natural gas, propane, fuel oil, tire-derived fuel at up to 15% of the total heat value, high carbon fly ash as high as 60% of the total heat value, and used oil.

The heat input to the system is determined by the raw material feed rate to the kiln and the burnability of the raw materials. Increase in feed rate or burnability will require increases in total heat input rate. The feed rate is limited by the plant mechanical design

and raw material properties. The raw material burnability is most dependent on the chemistry of the onsite raw materials and the raw meal fineness from the raw mill.

Fuel ratios will be affected by changes in fuel parameters, including heat value and volatility; fuel availability and delivered price.

Changes in heat input ratios or in fuels are not expected to have significant effects on emissions from the kiln system. Emissions variations over long averaging times are expected to be minimal in terms of concentration or mass per unit time. Most pollutant emissions are assumed as independent of fuels and heat input ratios. At all times emissions are expected to be within the limits proposed in the application.

Particulate matter emissions are assumed to be independent of fuels and heat input ratios and are limited by control equipment. CO and VOC emissions are controlled mainly by raw material selection and combustion practices, such as adequate turbulence and residence time following the combustion chamber.

SO₂ emissions are controlled by inherent scrubbing by the alkalis in the raw materials prior to the fuel firing locations and not by limiting sulfur from fuels. When sufficient alkali is present in the raw materials, sulfur from fuels exits the kiln system with clinker. Sulfur dioxide emissions observed from cement plants can result from sulfur in the fuel that is in excess of alkalis in the feed or from sulfur (e.g., pyritic sulfur) in raw materials fed to the preheater. Raw materials in Florida are typically low in pyritic sulfur.

NO_x emissions are affected by the fuels fired and the heat input ratios. More volatile fuels are often burned in the calciner to allow for more reduction of the NO_x generated by the main burner of the kiln. The combustion of tires functions in the same way to reduce NO_x emissions. The heat input ratio between the kiln burner and the calciner burner can affect NO_x emissions, as fuel burned in the kiln burner generates thermal NO_x due to the high temperatures encountered in this area. Fuels burned in the calciner burner at lower temperatures generate less NO_x per unit of heat input, and are also staged to create reducing zones.

During startup, fuel consumption will be greater than during steady state operations because heat is not recovered for combustion air. Emissions may likewise be affected as the kiln system is heated and raw materials are introduced through the preheater. Data from operating cement plants have demonstrated that mass emission limitations are not typically exceeded during startup.

7. Typical fuel specifications were provided for the proposed fuels with the exception of used oil. Provide a description and expected analysis of the used oil to be combusted.

Response: Typical used oil specifications are included as an attachment to this response.

8. Recent testing conducted at other cement plants in Florida indicated that lower NOX emissions are possible by selective non-catalytic reduction (SNCR) than proposed. According to the application, the cost-effectiveness to achieve 1.95 lb NOX/ton was estimated at a little more than \$1,000 per ton of NOX removed. An application was recently received by the State of Arizona proposing a limit of 1.15 lb/ton based on modeling results. An existing Heidelberger (SCANCEM) facility in Sweden achieves 0.9 lb NOX/ton by SNCR. Please develop and submit a cost-effectiveness analysis to achieve 1.5 and 1.0 lb NOX/ton of clinker.

Response: Cost effectiveness analyses to achieve 1.5 and 1.0 lb/ton clinker NOx emission limits using SNCR are included as an attachment to this response in Tables 1 and 2, respectively. As shown in Tables 1 and 2, the cost effectiveness for SNCR is \$982/ton of NOx removed and \$898/ton of NOx removed to achieve emission limits of 1.5 lb/ton clinker and 1.0 lb/ton clinker, respectively.

Of greater concern is the increased quantity of ammonia reagent necessary for higher levels of control, and corresponding effects on handling, storage, and ammonia slip.

9. With reference to Pages 77 and 78, Has Florida Mining Corporation inquired of catalyst manufacturers whether or not catalyst poisoning is a given if a selective catalytic reduction (SCR) system is located prior to the baghouse? Note that the dust loading in the area (parallel to downcomer from the preheater) where an SCR system is located is much lower than in the preheater and much lower than after the raw mill. There is much experience now at coal fired power plants operating SCR systems prior to electrostatic precipitators.

Response: Flemming Hansen, the manager of SCR Catalyst & Technology for Haldor Topsoe, a leading catalyst manufacturer for both the US and Europe, provided information in email correspondence dated June 30, 2005. Mr. Hansen stated:

“SCR for cement kilns have been studied by us and other catalyst suppliers but as SCR is not considered BACT, we don't see much "real" interest in pursuing this for plants in neither Europe nor US and have cutback further studies. To my knowledge there is only a single full scale installation, Solnhofen in Germany (dry kiln) which operates fairly well. Due to the high level of particulates, SCR for cement kiln can be problematic and cause clogging of the catalyst channels. The high alkali content in the cement dust can also cause poisoning of the catalyst. Based on our studies and testing we find that with the correct choice of catalyst pitch and frequent cleaning of the catalyst with steam or air blowers the operation of an SCR upstream of the particulate removal should be possible. Down stream of the particulate filters SCR operation should be relatively trouble free. “

Although Mr. Hansen stated that they believes it could be possible to operate an SCR system upstream of the PM control device with the “correct choice of catalyst pitch and frequent cleaning of the catalyst with steam or air blowers”, this is only theoretical and

has not been proven at a cement kiln operation. Therefore, SCR is not considered further as a feasible NO_x control technique for the cement kiln.

10. With respect to Section 6.4.3, please explain how SCR would operate in a cement plant in tandem with overfire air (OFA) and Low NO_x burners (LNB) described by Florida Mining Corporation as the “Top” control technique.

Response: In this control technique, OFA and LNB are utilized as part of the combustion system, while SCR would be utilized downstream of the combustion equipment. SCR along with OFA and LNB that is described in the application and listed as the “top” control technique in Table 7-9 is not specifically representing a cement plant operation. In a cement plant, OFA and LNB would be utilized at the kiln (where coal or other fuel is combusted) and the SCR system would operate outside of the kiln, downstream after the gas has cooled somewhat.

11. With reference to Page 75, reburn is actually incorporated into various staged combustion calciner designs. The procedure involves burning some or all of the calciner fuel in an aggressive reducing atmosphere. Arguably the F.L. Smidth Low NO_x calciner, the Polysius Multistaged Combustion (MSC) calciner at Florida Rock, and the KHD Humboldt Wedag Pyroclon all incorporate reburn to some degree. Does the reburn design described operate within the kiln, the calciner, or after the calciner?

Response: The plant design is currently in the preliminary stages and design details such as the description of incorporation of “reburn to some degree” is not yet known. Since this is a new plant design, the incorporation of reburn will be considered by the vendor in the final plant design. The location of reburn in the kiln, calciner, or after the calciner will also be determined in the final plant design.

12. NO_x control described in the application appears to rely on destroying thermal NO_x after it is formed in the kiln, prevention of fuel NO_x formation in the calciner, and/or destruction by reagent injection after the calciner. What consideration has been given to minimizing thermal NO_x formation by flame cooling, Low NO_x kiln burners, or “intelligent” automated expert control systems like Linkman or Polexpert?

Response: The prevention of NO_x emissions by low NO_x burners or similar plant designs are valid design considerations. However, the plant design is currently in the preliminary stages and designs to incorporate low NO_x burners or other pollution prevention techniques will be considered by the vendor and Florida Mining Corporation in the final plant design.

13. The BACT proposal for CO is 3.6 lb/ton of clinker. For reference, F.L. Smidth guaranteed a value of 1.77 lb CO/ton for the Titan project in Medley. Titan has requested a lower value of approximately 1.33 lb CO/ton while achieving 2.1 lb NO_x/ton of clinker. The Department’s observation is that some designs provide insufficient residence time following introduction of tertiary burnout air to adequately

reduce CO. Please evaluate (under your “Good Combustion Practices” proposal) the possibility of increasing the length of the ductwork from the top of the calciner to the bottom cyclone. The cost per ton of CO removed can be estimated from the construction and operational considerations associated with the residence time to complete burnout.

Response: An evaluation of ductwork length with respect to residence time for CO burnout will be recommended to the plant manufacturer, after selection. In this case, the Department’s request can be used to assist in the plant-specific design.

14. VOC control to achieve 0.12 lb/ton of clinker is given as “Good Combustion Practices”. Regardless of combustion practices, VOC emissions can be high unless raw materials (especially additives) are selected that will not evolve VOC in the preheater. Please describe the raw material procurement practices for mill scale, fly ash, etc. that can influence both VOC and CO emissions. The proposed value appears to be adequate.

Response: Detailed raw material procurement practices will be developed prior to plant operation. Such practices will ensure that raw materials (especially additives) are selected that will not evolve VOC in the preheater.

15. SO₂ control to achieve 0.28 lb/ton of clinker is given as “dry scrubbing (hydrated lime injection)” as necessary when the raw mill is not operating and inherent “limestone scrubbing” when the raw mill is operating. Please address the nature of the raw materials and include this in the Top Down analysis.

Response: Sulfur in the raw material from the property is assumed to be low, based on data from the USGS, included as an attachment to this report. The data show consistently low sulfur content in soils and surficial materials across central Florida, with concentrations of less than 0.08 percent.

16. The SO₂ limit for Florida Rock Kiln 1 is 0.16 lb/ton of clinker on a 24-hour basis. They do not practice hydrated lime injection. Please provide a rationale for the greater emission limit request given that hydrated lime injection is available if needed. Please provide data on sulfur in the raw material from the property.

Response: Per the recent permit No. 0010087-013-AC, the SO₂ limit for the proposed Florida Rock Kiln 2 is 0.28 lb/ton of clinker on a 24-hour basis, and hydrated lime injection is to be used when higher sulfur feed or fuels are used. The requested emission limit for the Florida Mining Mabel Cement Plant is identical.

Regarding Florida Rock Kiln 1, the initial BACT emission limit for SO₂ was also identical (i.e., 0.28 lb/ton clinker). The referenced emission limit of 0.16 lb/ton of clinker was volunteered by Florida Rock in 2002, with an accompanying production rate increase.

Sulfur in the raw material from the property is assumed to be low, based on data from the USGS, included as an attachment to this report. The data show consistently low sulfur content in soils and surficial materials across central Florida, with concentrations of less than 0.08 percent.

17. What additives will be used to insure the correct alkali to sulfur ratio is maintained when using petroleum coke? Florida limestone is low in alkali. Use of high sulfur petroleum coke can upset the balance between alkali and sulfur that is needed to insure fuel sulfur is incorporated into the clinker rather than deposited within the internal cycle (calciner/bottom cyclone/kiln inlet). Submit a projected chemical analysis of the additives likely to be used at this plant.

Response: The Department has addressed this question, in part, in a recent Best Available Control Technology Determination for Florida Crushed Stone, accompanying Permit no. 0530021-009-AC. In the determination, the Department states:

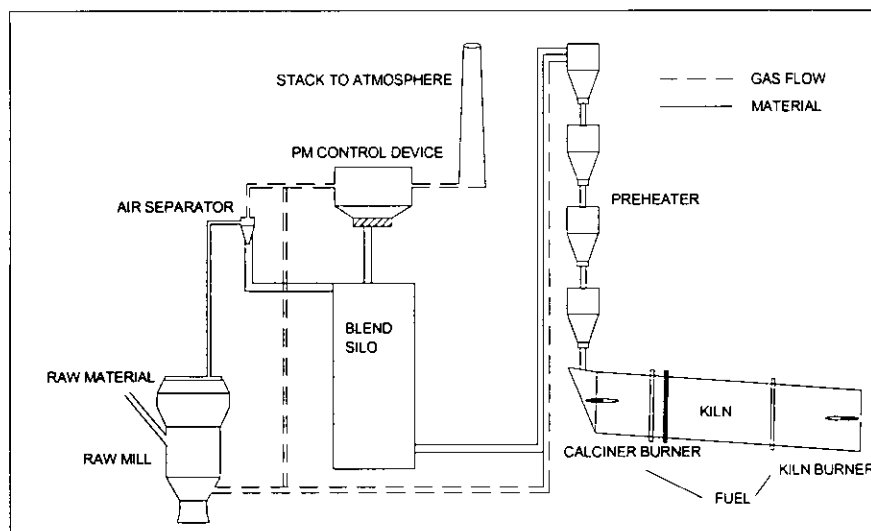
“The Department does not believe that burning of petroleum coke will cause additional SO₂ emissions compared with coal because of the virtually complete scrubbing that occurs in the calciner.”

The alkali-sulfur balance necessary to avoid internal buildup is an operational issue. The most common alkalis are sodium and potassium, and USGS data included with this response show that both are consistently low in soils and surficial materials across Florida. This may limit the amount of petroleum coke that can be burned, or provide the opportunity to seek additives containing these elements.

Projected chemical analyses of the additives likely to be used at this plant will be submitted to the Department when available.

18. Please provide a diagram showing the introduction points of mercury into the process and its fate including the internal cycle (calciner/kiln) and the external cycle (raw mill/preheater/dust control equipment). What measures have been considered to minimize emissions of mercury entering the process or emitted from the kiln stack?

Response: The following simplified diagram shows the introduction points for mercury into the process, and can illustrate the internal cycle and the external cycle.



Mercury is introduced into the process with raw materials at the raw mill and with fuels at the burners. Mercury in fuels is volatilized during combustion and is adsorbed on raw meal in the raw mill (when operating), adsorbed onto particulate matter captured by the particulate matter control device; or emitted to the atmosphere via the stack. Mercury in raw materials is volatilized by kiln exhaust gases in the raw mill and is adsorbed onto particulate matter captured by the particulate matter control device, or emitted to the atmosphere via the stack.

The external cycle is mercury emitted from the stack, and can be from raw materials and fuels, with or without the raw mill running. The internal cycle is from mercury adsorbed onto raw meal or dust captured by the control device; both of which are typically conveyed to the blending silo. The raw meal from the blending silo is conveyed to the preheater and the adsorbed mercury with any remaining mercury is volatilized again, within the internal cycle.

No specific measures have been considered to minimize emissions of mercury entering the process. Due to its volatility, virtually all of the mercury input to the system is assumed to be emitted to the atmosphere via the kiln stack. No specific measures have been considered to minimize emissions of mercury emitted from the stack. The proposed emission limitation for mercury is less than the PSD regulatory threshold.

19. Please provide the protocol for the mercury material balance to be relied upon to insure emissions are no greater than 122 lb/year. Include proposed process testing locations, frequency of testing, and methods. Please review the availability and capability of continuous mercury monitoring equipment in lieu of, or in addition to the material balance.

Response: The Department has established a monitoring protocol for mercury emissions in several permits, including the recent permit issued to Florida Crushed Stone (Permit

No. 0530021-009-AC). The protocol is acceptable to the applicant and is reproduced below:

Material Balance Analysis of Mercury: The owner or operator shall demonstrate compliance with the mercury throughput limitation by material balance and making and maintaining records of monthly and rolling 12-month mercury throughput. The owner or operator shall, for each month of sampling required by this condition, perform daily sampling of the raw mill feed, coal, petroleum coke, and tires, and shall composite the daily samples each month, and shall analyze the monthly composite sample to determine mercury content of these materials for the month. The owner or operator shall determine the mass of mercury introduced into the pyroprocessing system (in units of pounds per month) from the total of the product of the mercury content from the monthly composite analysis and the mass of each material or fuel used during the month. The consecutive 12-month record shall be determined from the individual monthly records for the current month and the preceding eleven months and shall be expressed in units of pounds of mercury per consecutive 12-month period. Such records shall be completed no later than 25 days following the month of the records. To determine the mercury content of the feed material and fuels to be used in the monthly calculation, sampling and analysis shall be performed in accordance with the following schedule:

- 1. During the first quarter of plant operation, sample each month and analyze each month's composite sample.*
- 2. After the first quarter, sample for one month of each quarter and analyze that month's composite sample.*

EPA is evaluating mercury CEM for the Utility MACT Working Group. In a March 2003 Mercury Monitoring Update, EPA identified certain concerns related to mercury CEM, including:

- Stability, reliability, and availability of calibration standards
- Loss of sample in handling system
- Species conversion
- CEMS costs, complexity, performance
- CEMS application on US sources
- Fuel, equipment, control uniqueness
- Availability

EPA is conducting further study. As mercury CEM are still being evaluated for utility sources, it is likely premature to consider for application to other source categories such as cement.

20. Has Florida Mining Corporation or affiliates had any violations (or warning letters) related to any Department regulations at any of their facilities? Have officers of Florida Mining Corporation also been officers of other companies that have had violations (or warning letters) of Department regulations at any facilities? Please provide all documentation in relation to any such violations.

Response: The Department issued a warning letter to Florida Mining Corporation, dated February 17, 2004, in which possible violations were presented. These possible violations were in reference to the construction of a culverted crossing of Jumper Creek to facilitate the removal of overburden and to support the existing agricultural operation. The crossing was constructed over surface waters, and according to the Department's assessment no wetlands were impacted due to the construction.

The applicant has since obtained an after-the-fact permit for the crossing, and continues to discuss with the Department the resolution of the potential violation.

No other violations or warning letters were identified.

21. Please list experience of company officers owning or operating industrial enterprises requiring air permits in the State of Florida or in other states.

Response: The Florida Department of State, Division of Corporations, Corporations Online Public Inquiry system, in the Officer/Director Detail section, lists only Paul Mazak, II as President of Florida Mining Corporation.

Mr. Mazak reports no prior experience owning or operating industrial enterprises requiring air permits in the State of Florida or in other states.

22. Please provide information as to the experience of the operators of the proposed site. If the position of plant operator is still to be determined, please describe the minimum requirements for this position established by your company including, but not limited to, total years experience in the cement industry, total years experience as plant operator, educational background, etc.

Response: The position of plant operator is still to be determined, and the applicant has not established minimum requirements for this position. Important factors will include total years experience in the cement industry, total years experience as plant operator, and educational background.

23. Please provide information as to the experience of the plant manager of the proposed site. If the position of plant manager is still to be determined, please describe the minimum requirements for this position established by your company including, but not limited to, total years experience in the cement industry, total years experience as plant manager, educational background, etc.

Response: The position of plant manager is still to be determined, and the applicant has not established minimum requirements for this position. Important factors will include total years experience in the cement industry, total years experience as plant manager, and educational background.

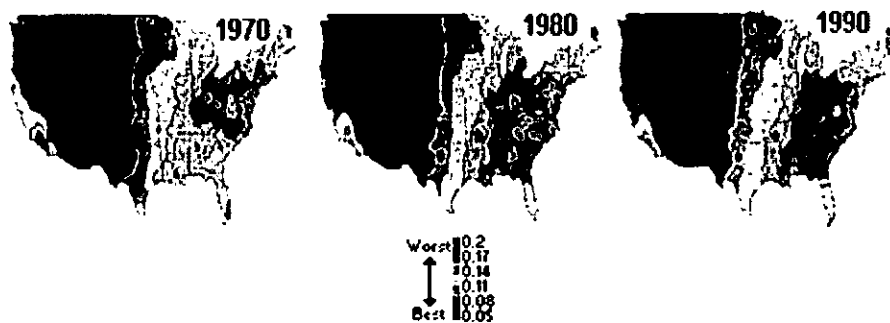
24. A very cursory assessment was provided pursuant to Paragraph 62-212.400(h)5., F.A.C. The rule requires information relating to the air quality impacts of, and the nature and extent of, all general commercial, residential, industrial and other growth which has occurred since August 7, 1977, in the area the facility or modification would affect. While the applicant believes the largest area is a 3 kilometer radius, the Department believes the radius arguably includes the entire county and possibly the contiguous counties. The impacts include visibility impairment and effects on regional ozone concentrations. Please expand the write-up to include development in Sumter and surrounding counties as well as ambient air quality trends in and near Sumter County.

Response: Although the report defined the area the plant would affect as equal to the area of significant impact, detailed information was provided on the nature and extent of, all general commercial, residential, industrial and other growth which has occurred since August 7, 1977, in Sumter County.

Expanding this assessment beyond the area the plant would affect for the entire county was necessary because the development parameters previously reported are available on a county-wide basis. Further expansion of the assessment of development to include surrounding counties is not warranted.

To be responsive to the Department, information was developed on visibility impairment and ambient air quality trends in and near Sumter County, including ozone concentrations; as a result of general commercial, residential, industrial and other growth which has occurred since August 7, 1977.

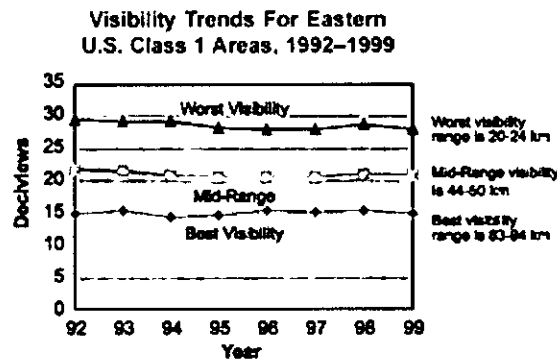
Visibility impairment¹ can be estimated from the following maps.



¹ <http://www.epa.gov/air/airtrends/aqtrnd94/vis.html>

Although the entire US is portrayed, it can be seen that visibility impairment in the central Florida area increased in 1980 relative to 1970, and then decreased in 1990 to the same approximate level as 1970.

A more recent table² shows that visibility improved in the eastern US between 1992 and 1999.



Ambient air quality trends near Sumter County, including ozone concentrations, were evaluated from the Department's Quick Look Reports from 1984 through 2004. Data was evaluated where available for Sumter County and the 6 contiguous counties (Citrus, Hernando, Lake, Marion, Pasco, and Polk). Data was used from nearby Orange County because suitable data was not available for Sumter County or the contiguous counties.

The data was used to chart the trend of concentrations of 5 criteria pollutants (PM₁₀, SO₂, CO, NO_x, and O₃) at given monitors. In order to span numerous and recent years, monitoring data was used from Orange County. Please note that the data from these monitors are not being presented as necessarily representative of ambient air quality conditions at the site or in Sumter County. Rather, these data are from a nearby county and span enough time to show trends in ambient air quality. Suitable lead monitoring data was not identified.

The charts are included as an attachment to this response. Remarkably, all pollutants and averaging times indicate downward trends in ambient concentrations.

25. Please provide a detailed discussion of the truck traffic that will be generated from the construction and operation of the kiln. Some of this information has already been provided on your spreadsheets describing the road sources. Please show where the values of 6.8 for init lat and 1.84 for init vert came from in your spreadsheet describing the paved roads emissions estimation. Please discuss how the release height of 0 meters was chosen. Please provide a diagram showing each road segment, its location and its emission parameters.

Response: A detailed discussion of the truck traffic that will be generated from the operation of the kiln was included within the application as well as in the referenced

² <http://www.epa.gov/air/airtrends/aqtrmd00/visible.html>

spreadsheets. Truck traffic generated from the construction of the kiln will be transient and minimal when compared to the truck traffic generated during operation.

The values of 6.8 meters for the initial lateral dimension (init lat); 1.84 meters for the initial vertical dimension (init vert); and 0 meters for the release height were all developed in accordance with the *User's Guide For The Industrial Source Complex (Isc3) Dispersion Models Volume II - Description Of Model Algorithms*. The following text is taken from the User's Guide.

“The ISC models use a virtual point source algorithm to model the effects of volume sources, which means that an imaginary or virtual point source is located at a certain distance upwind of the volume source (called the virtual distance) to account for the initial size of the volume source plume. There are two types of volume sources: surface-based sources, which may also be modeled as area sources, and elevated sources. An example of a surface-based source is a surface rail line. **The effective emission height for a surface-based source is usually set equal to zero.**

The user also assigns initial lateral (σ_{y0}) and vertical (σ_{z0}) dimensions for the volume source. Lateral (x_y) and vertical (x_z) virtual distances are added to the actual downwind distance x for the σ_y and σ_z calculations. The virtual distances are calculated from solutions to the sigma equations as is done for point sources with building downwash.

The north-south and east-west dimensions of each volume source used in the model must be the same. Table 1-6 summarizes the general procedures suggested for estimating initial lateral and vertical dimensions for single volume sources and for **multiple volume sources used to represent a line source**. In the case of a long and narrow line source such as a rail line, it may not be practical to divide the source into N volume sources, where N is given by the length of the line source divided by its width. The user can obtain an approximate representation of the line source by placing a smaller number of volume sources at equal intervals along the line source, as shown in Figure 1-8. In general, the spacing between individual volume sources should not be greater than twice the width of the line source.

Figure 1-8 illustrates representations of a curved line source by multiple volume sources. Emissions from a line source or narrow volume source represented by multiple volume sources are divided equally among the individual sources unless there is a known spatial variation in emissions.”

TABLE 1-6

SUMMARY OF SUGGESTED PROCEDURES FOR ESTIMATING
 INITIAL LATERAL DIMENSIONS σ_{yo} AND
 INITIAL VERTICAL DIMENSIONS σ_{zo} FOR VOLUME AND LINE SOURCES

Type of Source	Procedure for Obtaining Initial Dimension
(a) Initial Lateral Dimensions (σ_{yo})	
Single Volume Source	σ_{yo} = length of side divided by 4.3
Line Source Represented by Adjacent Volume Sources (see Figure 1-8(a))	σ_{yo} = length of side divided by 2.15
Line Source Represented by Separated Volume Sources (see Figure 1-8(b))	σ_{yo} = center to center distance divided by 2.15
(b) Initial Vertical Dimensions (σ_{zo})	
Surface-Based Source ($h_e = 0$)	σ_{zo} = vertical dimension of source divided by 2.15
Elevated Source ($h_e > 0$) on or Adjacent to a Building	σ_{zo} = building height divided by 2.15
Elevated Source ($h_e > 0$) not on or Adjacent to a Building	σ_{zo} = vertical dimension of source divided by 4.3

For this project, the roadway width is 24 feet. The dimensions of each volume source are therefore 24 feet by 24 feet (7.31 m x 7.31 m). The roadway was modeled using an approximate representation of a line source by multiple separated volume sources. As shown below in Figure 1-8, the spacing between the separated volume sources is twice the width of each volume source (14.63 m).

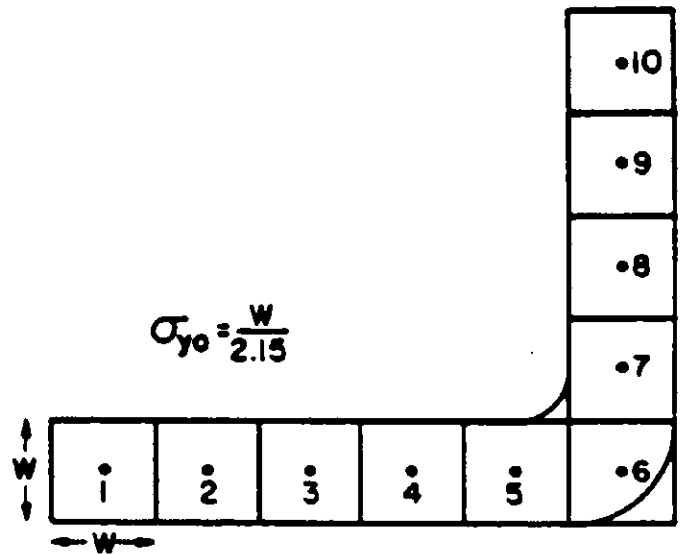
The initial lateral dimensions (init lat) for a line source represented by separated volume sources (see Figure 1-8(b)) is determined by dividing the center to center distance by 2.15.

$$14.63 \text{ m} \div 2.15 = \underline{\underline{6.80 \text{ meters}}}$$

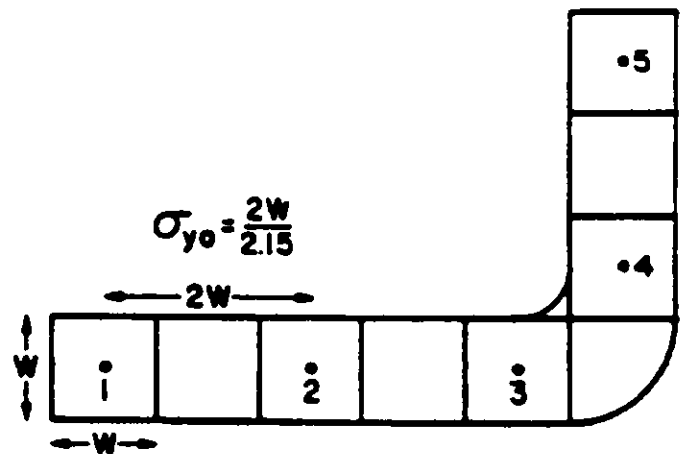
The initial vertical dimensions (init vert) for a surface-based source (release height = 0 m) is determined by dividing the vertical dimension of source by 2.15. The vertical dimension of each volume source is the height of the trucks, assumed as 13 feet (3.96 m).

$$3.96 \text{ m} \div 2.15 = \underline{\underline{1.84 \text{ meters}}}$$

A diagram is included as an attachment to this response, showing each road segment, its location and its emission parameters.



(a) EXACT REPRESENTATION



(b) APPROXIMATE REPRESENTATION

FIGURE 1-8. EXACT AND APPROXIMATE REPRESENTATIONS OF A LINE SOURCE BY MULTIPLE VOLUME SOURCES

26. The facility plot plan on page 11 does not show the dimensions and location of the buildings and structures on the property. Please provide a plot plan with UTM coordinates overlaid in a 100 meter grid showing the locations and the dimensions of the buildings and structures.

Response: The previously submitted facility plot plan showing dimensions and locations of proposed buildings and structures did not reproduce well. A revised plot plan with UTM coordinates overlaid in a 100 meter grid showing the locations and the dimensions of the buildings and structures is included as an attachment to this response.

27. Please provide a nitrogen deposition analysis for the Chassahowitzka PSD Class I area.

Response: The National Park Service (NPS) and the U.S. Fish and Wildlife Service (FWS) have developed criteria for evaluating the contribution of additional nitrogen (N) to deposition within Class I areas, titled *Guidance on Nitrogen and Sulfur Deposition Analysis Thresholds*.³ The NPS and FWS have developed this DAT equation in response to requests by permitting authorities and permit applicants to continue to develop consistent, predictable permit review processes, and to expedite the permit review process. The FLMs have applied the 4% value used in Class I increment significant impact levels to these new deposition analysis thresholds. By incorporating this value into the DAT equations, new sources whose modeled deposition amounts are below the DATs are not likely to significantly contribute to cumulative impacts from N or S deposition.

A DAT is the additional amount of N deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant. The DAT for Chassahowitzka National Wildlife refuge was compared with the amount of additional deposition resulting from the Mabel Cement Plant, as modeled using CALPUFF. The N DAT represents total N, including both wet and dry deposition. Total nitrogen includes NO, NO₂, HNO₃, NO₃, NH₃, and NH₄. Total N was selected in order to be consistent with conventions used in deposition loading, to represent the total amount of N inputs received in an ecosystem and to be compatible with CALPUFF model outputs.

The DAT for nitrogen in Eastern Class I parks and refuges is: 0.01 kg/ha/yr N.

Guidance for using the CALPUFF modeling system to estimate nitrogen deposition was obtained from *Guide for Applying the EPA Class I Screening Methodology with the CALPUFF Modeling System*, from Earth Tech, Inc., dated September 2001. The outputs for the previous CALPUFF runs included all concentrations and deposition fluxes written to binary files. The 5 CALPUFF runs, one for each year modeled (1986-1990), resulted

³ http://www2.nature.nps.gov/air/Permits/flag/docs/N_SDATGuidance.pdf

in 5 sets of binary files. Each set included one file for the modeled concentrations, one file for the modeled dry deposition fluxes, and one file for the modeled wet deposition fluxes, calculated at every receptor, for each hour of the year. Using these files, the post-processing tasks included characterizing peak concentrations of several species for several averaging times (previously submitted), characterizing peak annual deposition rates of total nitrogen, and characterizing the change in visibility (previously submitted).

Prior to applying CALPOST to obtain the deposition outputs, POSTUTIL was used to consolidate the deposition fluxes. In particular, POSTUTIL was used to sum the wet and dry deposition fluxes into the total deposition flux of each species, and it converted various fluxes to the total nitrogen fluxes.

A CALMET file was not needed for this application because no nitrate partitioning was calculated. Two CALPUFF binary files were needed for this application: one for the dry deposition flux, and one for the wet deposition flux. Full years of 8760 hours (8784 hours for leap years) were processed in the screening assessments.

The 5 MESOPUFF II chemical transformation species were needed to compute the total nitrogen fluxes (the sum of the wet and dry fluxes):

- SO₂
- SO₄
- NO_x
- HNO₃
- NO₃

The postprocessing included the information required to compute the new species, using a weighted sum of the deposition fluxes of the stored species. Nitrogen mass is contributed by SO₄ (CALPUFF tracks ammonium sulfate as SO₄), NO_x, HNO₃, and NO₃ (CALPUFF tracks ammonium nitrate as NO₃). The atomic weights for the constituent elements are sulfur = 32, oxygen = 16, nitrogen = 14, and hydrogen = 1. The molecular formula for ammonium sulfate is (NH₄)₂SO₄ and ammonium nitrate is (NH₄)NO₃. Therefore:

- 1 g of SO₄ contributes 0.291667 g of N
- 1 g of NO_x contributes 0.304348 g of N
- 1 g of HNO₃ contributes 0.222222 g of N
- 1 g of NO₃ contributes 0.451613 g of N

The peak total nitrogen deposition flux was then estimated using CALPOST. The maximum total annual nitrogen deposition was for 1987, and was $2.0e^{-11}$ g/m²/sec. This is equivalent to 0.006 kg/ha/yr. As this value is less than the DAT for nitrogen in Eastern Class I parks and refuges of 0.01 kg/ha/yr, estimated impacts from the proposed new source are considered insignificant by the Federal Land Manager.

28. Please provide a table in Section 4 summarizing all of pollutant emission rates that were included in the Class I area PSD increment and visibility modeling.

Response: This response includes a table summarizing all of pollutant emission rates that were included in the Class I area PSD increment, visibility, and deposition modeling.

<u>SRCNAME</u>	<u>Emission Rates (g/s)</u>		
	<u>SO2</u>	<u>NOx</u>	<u>PM10</u>
BAG	0.00E+00	0.00E+00	9.62E-02
BIN	0.00E+00	0.00E+00	1.03E-02
BLEND1	0.00E+00	0.00E+00	9.92E-02
BLEND2	0.00E+00	0.00E+00	1.54E-02
BLEND3	0.00E+00	0.00E+00	1.78E-02
CEMENT1	0.00E+00	0.00E+00	9.47E-02
CEMENT2	0.00E+00	0.00E+00	9.47E-02
CEMENT3	0.00E+00	0.00E+00	2.57E-02
CLINKER1	0.00E+00	0.00E+00	2.06E-02
CLINKER2	0.00E+00	0.00E+00	2.20E-02
CLINKER3	0.00E+00	0.00E+00	2.37E-02
CLINKER4	0.00E+00	0.00E+00	2.37E-02
CLINKER5	0.00E+00	0.00E+00	2.06E-02
CLINKER6	0.00E+00	0.00E+00	2.06E-02
COAL1	0.00E+00	0.00E+00	1.48E-01
COAL2	0.00E+00	0.00E+00	1.89E-02
COOLER	0.00E+00	0.00E+00	1.26E+00
KILN	4.41E+00	3.07E+01	3.15E+00
MILL1	0.00E+00	0.00E+00	2.45E-01
MILL2	0.00E+00	0.00E+00	3.06E-02
MILL3	0.00E+00	0.00E+00	7.95E-01
RAW1	0.00E+00	0.00E+00	2.19E-02
RAW2	0.00E+00	0.00E+00	2.19E-02
RAW3	0.00E+00	0.00E+00	3.64E-02
RAW4	0.00E+00	0.00E+00	3.64E-02

29. Predicted impacts from all applicable PSD pollutants on soils, vegetation and wildlife should be included in the Additional Impact Analysis. In the application, the Additional Impact Analysis includes impacts to soils and vegetation from PM10 only. Please provide an analysis for the other PSD pollutants subject to review for this project. Please also include impacts to wildlife in your analysis.

Response: The applicable regulation, at Rule 62-212.400(5)(e), F.A.C., states in pertinent part that the owner or operator of the proposed facility or modification shall provide the Department with analyses of the impairment to soils and to vegetation having a significant commercial or recreational value, that would occur as a result of the facility or modification and associated commercial, residential, industrial and other growth. No mention is made of impacts to wildlife. Further, it was assumed that the pollutants that

caused less than significant impacts to ambient air would likewise not impact vegetation and soils. The impacts for all PSD pollutants except for PM₁₀, were a fraction of the Department's De Minimis impact levels.

In order to be responsive to the Department, this response includes an expanded Additional Impact Analysis, for all PSD pollutants, addressing impacts to soils, vegetation, and wildlife.

In accordance with the *Draft New Source Review Workshop Manual*, the depth of the analysis depends on existing air quality, the quantity of emissions, and the sensitivity of local soils and vegetation in the source's impact area. The analysis fully documents all sources of information, and underlying assumptions utilized as a part of the analysis. This guidance confirms that the geographical scope of the additional impact analyses is the significant impact area, 3 km in this case.

The PSD pollutants for this project are as follows:

- Carbon monoxide (CO)
- Nitrogen oxides (NO_x)
- Sulfur dioxide (SO₂)
- Ozone/Volatile organic compounds (O₃/VOC)
- Particulate matter (PM)
- Particulate matter (PM₁₀)

Impacts to soils, vegetation, and wildlife from the PSD pollutants could result from ambient concentrations or from deposition. Screening concentrations⁴ for exposure to ambient air concentrations of CO, NO_x, SO₂, and ozone were compared to site-specific modeling results for CO, NO_x, and SO₂; and to monitored data for ozone.

Screening values⁵ for deposition for sulfur and nitrogen were compared to site-specific modeling results, generated through the use of the CALPUFF modeling system for this near-field application. Radial receptors were used on radii from 100 meters to 3 kilometers, at 100 meter increments. The directional lines were set equal to 16 directions (e.g., N, NNE, NE) with 22.5 degree spacing.

No information was identified for evaluating impacts of particulate matter on soils, vegetation, or wildlife. For the purposes of this application, it is assumed that the ambient air quality standards and Class II area increments provide adequate protection from impacts to soils, vegetation, and wildlife resulting from source emissions of particulate matter.

⁴ A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals, EPA 450/2-81-078, December 1980.

⁵ A Screening Procedure to Evaluate Air Pollution Effects on Class I Wilderness Areas, United States Department of Agriculture, General Technical Report RM168, 1989.

Soils

The soils in the impact area are described by the *Soil Survey of Sumter County*. The general soils map in the soil survey (attached) shows four soil types or complexes within the area of significant impact:

- 1. Astatula
- 6. Paisley-Ft. Green-Vero
- 9. EauGallie-Delray
- 10. Myakka-Placid-Ona

The general soil map shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern .

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

1. Astatula

Nearly level to strongly sloping, excessively drained soils that are sandy to a depth of more than 80 inches. The soils in this map unit are on gently undulating to rolling sandhills and ridges. The slopes range from 0 to 15 percent. Most of these soils are in the northern part of Sumter County.

6. Paisley-Ft. Green-Vero

Nearly level to gently sloping, poorly drained, sandy soils; some have a clayey or loamy subsoil, and some are sandy and dark in the upper part of the subsoil and loamy and clayey in the lower part. The soils in this map unit are on the flatwoods and on broad ridges, low flats, and small knolls. The slopes range from 0 to 3 percent. Most of these soils are north of Lake Panasoffkee, along the Outlet River, south of Center Hill, and north of the Polk County line.

9. EauGallie-Delray

Nearly level, poorly drained and very poorly drained, sandy soils; some have a sandy dark subsoil within 30 inches of the surface; and all have a loamy subsoil at a depth of more than 40 inches. The soils in this map unit are on nearly level flatwoods and oak hammocks that are interspersed with depressions that are connected by narrow drainageways. The slopes range from 0 to 2 percent. The largest area of these soils is in the southern panhandle. Other areas are scattered around the southern part of the county.

10. Myakka-Placid-Ona

Nearly level, poorly drained and very poorly drained, sandy soils; some have a sandy, dark subsoil, and some are sandy throughout and do not have a subsoil. The soils in this

map unit are on the flatwoods, mainly in the east-central part of Sumter County that is adjacent to Lake County and west of Coleman. The slopes range from 0 to 2 percent.

Impacts to soils as a result of sulfur deposition were estimated using *A Screening Procedure to Evaluate Air Pollution Effects on Class I Wilderness Areas*. It should be recognized that the loadings suggested by this screening technique are likely to overestimate potential impacts. The screening concept uses numerical values of sulfur and nitrogen deposition and ozone concentrations in nine different wildernesses considered representative of the diversity of wilderness ecosystems.

A conceptual framework was developed to help evaluate the potential impact of proposed new air pollution sources. This framework includes the idea of acceptable (Green Line), unacceptable, (Red Line), and intermediate (Yellow Zone) levels of pollution. Specifically, the Green Line denotes a total loading (current deposition plus predicted additional deposition from the new source) of sulfur and nitrogen and the total dose of ozone that predicts, with a very high degree of certainty, that no AQRV will be adversely affected. Ozone was considered only to affect terrestrial ecosystems.

Two criteria or effects were considered to set the Green and Red Line levels of deposition for sulfur:

- (1) removal of base cations from soil, a “capacity” effect, and
- (2) the "intensity" effects resulting from changes in soil solution composition.

Nitrogen is the only major plant nutrient that does not accumulate to any significant extent in soils. Any increase in N deposition will most probably result in some increase in vegetation growth, and may actually improve the health of the ecosystem.

A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals was also reviewed for this response. That report states that no direct impacts on soils are defined, such impacts being screened through the potential impacts on soils. Impacts on fauna are also addressed indirectly with effects being related to the ingestion of plants.

The Joyce Kilmer, NC/Slick Rock, TN wilderness areas were selected as most representative for conditions in the eastern United States. The Green Line for total nitrogen deposition is 7-10 kg/ha/year, and for sulfur deposition is 5-7 kg/ha/year.

The CALPUFF modeling system was used to determine the maximum deposition rates of total nitrogen and total sulfur in the impact area. The maximum modeled nitrogen deposition rate at any receptor was 0.2 kg/ha/year; and the maximum modeled sulfur deposition rate at any receptor was 0.8 kg/ha/year. As these deposition rates are well below the Green Line screening values, no further analysis was conducted.

The monitored ozone in Winter Park, second-highest 1-hour average value, averaged over the most recent 5 years (2000-2004) is 96 ppb. This value falls between the Green

Line screening value of 75 ppb and the Red Line screening value of 110 ppb. The source's effects on regional ozone concentrations are unknown, but are not expected to be significant. It is assumed that source emission effects on ozone concentrations will not cause adverse effects on soils, vegetation, or wildlife.

Vegetation

Vegetation having significant commercial or recreational value was identified by the *Soil Survey*.

The soils in the impact area are described by the *Soil Survey of Sumter County*. The general soils map in the soil survey (attached) shows four soil types or complexes within the area of significant impact:

- 1. Astatula
- 6. Paisley-Ft. Green-Vero
- 9. EauGallie-Delray
- 10. Myakka-Placid-Ona

1. Astatula

The native vegetation is sand pine, bluejack oak, turkey oak, and scrub oak. The understory is rosemary, running oak, and scattered saw palmetto. Most of the acreage in this map unit is in native vegetation. The rest is mostly in improved pasture.

6. Paisley-Ft. Green-Vero

The native vegetation is scattered slash pine and longleaf pine, live oak, hickory, palms, and sweetgum. The understory is saw palmetto, inkberry, pineland threeawn, gallberry, waxmyrtle, panicums, and grapevines. Most of the acreage in this map unit is in native vegetation. Some areas are used as improved pasture and as rangeland.

9. EauGallie-Delray

The native vegetation is slash pine, water oak, laurel oak, saw palmetto, and running oak and also cypress in depressional areas. Most of the acreage in this map unit is in native vegetation.

10. Myakka-Placid-Ona

The native vegetation is longleaf pine, slash pine, gallberry, and saw palmetto and also cypress in depressional areas. Most of the acreage in this map unit is used as rangeland or woodland.

A more detailed review of commercially significant vegetation was conducted for the nine major soil types described within the general soil types:

- 3. Astatula
- 9. Paisley
- 21. EauGallie

- 23. Ona
- 26. Vero
- 30. Placid
- 31. Myakka
- 46. Ft. Green
- 60. Delray

Various tables in the Soil Survey were reviewed for these soil types.

Table 4. --Land Capability Classes And Yields Per Acre Of Crops And Pasture
 [Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map Unit	Watermelons (tons)	Tomatoes (tons)	Cucumbers (tons)	Bell Peppers (bushels)	Squash (bushels)	Bahiagrass (animal unit/month)	Sorghum Silage (tons)
3: Astatula	---	---	---	---	---	3.0	---
9: Paisley	---	---	11	600	200	10.0	10
21: EauGallie	10	8	8	400	150	8.0	10
23: Ona	10	12	8	600	500	8.5	10
26: Vero	10	13	5	300	500	7.0	10
30: Placid	---	---	---	---	---	---	---
31: Myakka	10	8	8	400	200	8.0	8
46: Ft. Green	---	12	10	600	200	8.0	10
60: Delray	---	---	---	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map Unit	Trees to Plant
3: Astatula	Sand pine
9: Paisley	Slash pine, loblolly pine
21: EauGallie	Slash pine, loblolly pine, longleaf pine
23: Ona	Slash pine, longleaf pine
26: Vero	Slash pine, longleaf pine
30: Placid	None recommended
31: Myakka	Slash pine, longleaf pine
46: Ft. Green	Slash pine, loblolly pine
60: Delray	None recommended

TABLE 8.--RECREATIONAL DEVELOPMENT

[Terms describe level of restrictions to use based on soil limitations and features. Absence of an entry indicates that the soil was not rated]

Map Unit	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
3: Astatula	Severe	Severe	Severe	Severe	Severe
9: Paisley	Severe	Severe	Severe	Severe	Severe
21: EauGallie	Severe	Severe	Severe	Severe	Severe
23: Ona	Severe	Severe	Severe	Severe	Severe
26: Vero	Severe	Severe	Severe	Severe	Severe
30: Placid	Severe	Severe	Severe	Severe	Severe
31: Myakka	Severe	Severe	Severe	Severe	Severe
46: Ft. Green	Severe	Severe	Severe	Severe	Severe
60: Delray	Severe	Severe	Severe	Severe	Severe

A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals was reviewed. The document provided ambient concentrations for various pollutants in relation to vegetation sensitivity. The concentration for the most sensitive vegetation for each pollutant is compared to the modeled concentration (monitored concentration for ozone) in the following table. Where reasonable to do so, concentrations for atypical averaging periods were estimated through the use of the ISC model. The comparisons used the highest-first-high from any year modeled (1987-1991).

Pollutant	Averaging Time	Screening Concentration	Modeled Concentration
SO ₂	1 hour	917 µg/m ³	8.71 µg/m ³
	3 hours	786 µg/m ³	6.64 µg/m ³
	1 year	18 µg/m ³	0.12 µg/m ³
Ozone Monitored 2004	1 hour	0.20 ppm	0.091 ppm
	8 hour	0.06 ppm	0.078 ppm
NO ₂	4 hours	3760 µg/m ³	35.22 µg/m ³
	8 hours	3760 µg/m ³	30.27 µg/m ³
	1 month	564 µg/m ³	2.23 µg/m ³
	1 year	94 µg/m ³	0.82 µg/m ³
CO	24 hours	1 week = 1,800,000 µg/m ³	11.12 µg/m ³
	1 month		2.23 µg/m ³

All modeled source-alone concentrations are much less than the screening concentrations. The monitored 8-hour ozone concentration is greater than the screening concentration for sensitive vegetation, but is less than the screening concentration for intermediate vegetation.

Based on the above analysis, adverse impacts to vegetation as a result of source emissions are not expected.

Wildlife

The wildlife in Sumter County is described the Florida Natural Areas Inventory. An online search showed 75 Total Elements (biological occurrences) in Sumter County. The lists are included as an attachment to this response. The lists included the following:

- Amphibians
- Reptiles
- Birds
- Mammals
- Gastropods (Snails and Allies)
- Plants

Although the lists included certain plants, commercially significant vegetation was identified by the soil survey and is discussed above. The soil survey also included a table describing potential as habitat for openland wildlife, woodland wildlife, and wetland wildlife.

TABLE 9.--WILDLIFE HABITAT

Map Unit	Potential for habitat for:		
	Openland wildlife	Woodland wildlife	Wetland wildlife
3: Astatula	Poor	Poor	Very poor
9: Paisley	Fair	Fair	Good
21: EauGallie	Poor	Poor	Poor
23: Ona	Fair	Fair	Fair
26: Vero	Poor	Fair	Poor
30: Placid	Very poor	Very poor	Good
31: Myakka	Fair	Poor	Poor
46: Ft. Green	Fair	Fair	Fair
60: Delray	Very poor	Very poor	Good

No information was identified for evaluating direct impacts to wildlife from emissions of PSD pollutants. Some information was reviewed that described indirect effects to wildlife resulting from impacts to vegetation, including habitat alteration and ingestion of vegetation. The screening procedures were not applicable for this project.

For the purposes of this application, it is assumed that the ambient air quality standards and Class II area increments provide adequate protection from impacts to wildlife resulting from source emissions of PSD pollutants.

Attachments

- Attachment 1: Typical Used Oil Specifications
- Attachment 2: BACT Tables
- Attachment 3: USGS Data – Element Concentrations
- Attachment 4: Ambient Concentration Charts
- Attachment 5: Road Source Diagram
- Attachment 6: Revised Plot Plan
- Attachment 7: Sumter County General Soils Map
- Attachment 8: Florida Natural Areas Inventory
- Attachment 9: CD with Dispersion and Deposition Modeling Files

August 3, 2005 Letter to A.A. Linero – Response to RAI
Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 1
Typical Used Oil Specifications

⊗ XERAY Systems

Date: December 29, 1998

To: Mr. Steve Cullan
Koolger and Associates
Telephone: 352.377.5822
Facsimile: 352.377.7158

Subject: Typical Used Motor Specifications

Number of Pages including the Coversheet: 2

Comments:

Per our conversation, attached is a copy of the Typical Used Motor Oil Specifications.

Any questions please advise.

Regards,

Rex P. Bryan

3730 Kirby Drive
Houston, Texas 77098

Suite 1020A

Telephone (713) 520-5600
Facsimile (713) 520-7088

⊗ XERAY Systems

Typical Used Lube Oil Specifications

Specification	Test Method	Range	Typical	Spec's
API Gravity	D-1298	15.0-30.0	25.0	_____
Viscosity @ 122F-CST	D-445	10-50	35	_____
Sulfur - Wgt. %	D-4294	0.0-4.0	0.5	_____
Flash Point - PMCC, F	D-93	130 min	175	_____
Pour Point - F	D-97	-20.0 - +80.0	0.0	_____
* Ash - Wgt. %	D-482	0.40-1.50	0.7	_____
* Water by - Vol. %	D-95	0.00-10.00	6.0	_____
* Sediment by - Wgt. %	D-473	0.50-1.50	0.25	_____
* Sodium - PPM	D5185	100-5,000	220	_____
* Potassium - PPM	D5185	20-100	60	_____
* Calcium - PPM	D5185	500-1,000	600	_____
Asphaltenes - Wgt %	AA/IP143	0.5-10.0	2.0	_____
Aluminum - PPM	AA/IP377	10-200	20	_____
Silicon - PPM	AA/IP377	20-100	50	_____
Vanadium - PPM	AA/IP288	1-500	2	_____
Arsenic - PPM	EPA-7060	0.0-50	2	_____
Cadmium - PPM	EPA-6010	0.0-50	1	_____
Chromium - PPM	EPA-6010	0.0-100	3	_____
Lead - PPM	EPA-6010	0.0-500	30	_____
Zinc - PPM	EPA-6010	400-700	500	_____
Total Halogens - PPM	D-808	<1,000	<1,000	_____
PCB's	D-5059			_____
Other	_____	_____	_____	_____

April 8, 1997

Customer: _____

Date: _____

Location: _____

Contact: _____

Product: _____

August 3, 2005 Letter to A.A. Linero – Response to RAI
Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 2
BACT Tables

Table 1. Economical Analysis for SNCR for NO_x Control from a Cement Kiln

Cost Item	Factor	Total Cost
Direct Capital Costs:		
Kiln Heat Input (MMBtu/hr), Q _B		400 MMBtu/hr
Control Efficiency (%), η _{NO_x}		64 %
NO _{x outlet} (proposed emission limit)		1.5 lb/ton clinker
NO _{x outlet} (proposed emission limit)		187.5 lb/hr
NO _{x outlet} (proposed emission limit)		0.47 lb/MMBtu
NO _{x uncontrolled} ^a		525.0 lb/hr
NO _{x uncontrolled}		1.31 lb/MMBtu
Direct Capital Cost, DC = \$950/MMBtu x Q _B x (2,375/Q _B) ^{0.577} x (0.66 + 0.85xη _{NO_x})		\$1,281,311
Indirect Capital Costs:		
<u>Installation</u>		
General Facilities	0.05*DC	\$64,066
Engineering and Home Office Fees	0.10*DC	\$128,131
Process Contingency	0.05*DC	\$64,066
Total Indirect Installation Costs, B		\$256,262
Project Contingency, C = 0.15 * (DC+B)		\$230,636
Total Plant Cost, D = DC + B + C		\$1,768,209
Allowance for Funds During Construction, E = 0 (assumed for SNCR)		0
Royalty Allowance, F = 0 (assumed for SNCR)		0
Preproduction Cost, G = 0.02 * (D+E)		\$35,364
Inventory Capital (cost for urea stored at site), H = Vol _{reagent} (gal) x Cost _{reagent} (\$/gal)		\$7,711
Vol _{reagent}		9,072 gal
Cost _{reagent}		\$0.85 /gal
Initial Catalyst and Chemicals, I = 0 (for SNCR)		0
Total Capital Investment, TCI = D + E + F + G + H + I		\$1,811,284
Annual Costs:		
<u>Direct Annual Costs</u>		
Operating and Supervisor Labor (assumed for SNCR = 0)		0
Maintenance	0.015*TCI	\$27,169
Reagent Consumption (t _{op} assumed to 8,760 hr/yr)	q _{sol} Cost _{reagent} t _{op}	\$562,909
mass flow rate of reagent (m _{reag})		358.74 lb/hr
mass flow rate of solution (m _{sol})		717.49 lb/hr
q _{sol} = m _{sol} * ρ / 71.0 lb/ft ³		75.60 gph
<u>Utilities</u> , P = (0.47*NO _{x in} *NSR*Q _B) / 9.5		42.3 kW
NSR = [(2 * NO _{x uncontrolled})+0.7]*η _{NO_x} / NO _{x uncontrolled}		1.63
Annual electricity cost	P*Cost _{elect} *t _{op}	\$37,055
Cost _{elect}		0.10 \$/kW
<u>Water Consumption</u>		
Water flow rate, q _{water} = 4 * m _{sol} /ρ _{water}		343.91 gph
Annual water cost = q _{water} *Cost _{water} (\$0.0004/gal)*t _{op}		\$1,205.07
<u>Coal and Ash</u>		
Coal (MMBtu/hr) = (900 Btu/lb * m _{reagent} (lb/hr) * 9) / 10 ⁶ (Btu/MMBtu)		2.91 MMBtu/hr
Ash = [Coal (MMBtu/hr) * 0.077 * 10 ⁶ Btu/MMBtu] / 10,000 Btu/lb		22.37 lb/hr
Ash _{cost} = Ash (MMBtu/hr) x \$11.28/ton x 8,760 hr/yr / 2,000 lb/ton		\$1,105 /yr
Coal _{cost} = Coal (MMBtu/hr) x \$1.6/MMBtu x 8,760 hr/yr		\$40,728 /yr
Annual Coal & Ash Cost =		\$41,833

Table 1. Economical Analysis for SNCR for NO_x Control from a Cement Kiln

Cost Item	Factor	Total Cost
<u>Indirect Annual Costs</u>		
Capital Recovery Factor (assuming 7% interest rate and 20 years economic life)		0.09439
Indirect Annual Costs, IDAC = CRF*TCI		\$170,967
Total Annual Cost, TAC = DC + IDAC		\$1,452,278
Tons of NO _x removed		1,478 tons
Cost Efficiency		\$982 /ton

^a Based on AP-42 Table 11.6-8 Portland Cement Manufacturing for a Preheater/Preheater Kiln and a clinker production rate of 125 TPH.

Source: EPA's Cost Control Manual (January 2002).

Table 2. Economical Analysis for SNCR for NO_x Control from a Cement Kiln

Cost Item	Factor	Total Cost
Direct Capital Costs:		
Kiln Heat Input (MMBtu/hr), Q _B		400 MMBtu/hr
Control Efficiency (%), η _{NO_x}		76 %
NO _{x outlet} (proposed emission limit)		1.0 lb/ton clinker
NO _{x outlet} (proposed emission limit)		125 lb/hr
NO _{x outlet} (proposed emission limit)		0.31 lb/MMBtu
NO _{x uncontrolled} ^a		525.0 lb/hr
NO _{x uncontrolled}		1.31 lb/MMBtu
Direct Capital Cost, DC = \$950/MMBtu x Q _B x (2,375/Q _B) ^{0.577} x (0.66 + 0.85xη _{NO_x})		\$1,388,782
Indirect Capital Costs:		
<u>Installation</u>		
General Facilities	0.05*DC	\$69,439
Engineering and Home Office Fees	0.10*DC	\$138,878
Process Contingency	0.05*DC	\$69,439
Total Indirect Installation Costs, B		<u>\$277,756</u>
Project Contingency, C = 0.15 * (DC+B)		\$249,981
Total Plant Cost, D = DC + B + C		\$1,916,519
Allowance for Funds During Construction, E = 0 (assumed for SNCR)		0
Royalty Allowance, F = 0 (assumed for SNCR)		0
Preproduction Cost, G = 0.02 * (D+E)		\$38,330
Inventory Capital (cost for urea stored at site), H = Vol _{reagent} (gal) x Cost _{reagent} (\$/gal)		\$7,711
Vol _{reagent}		9,072 gal
Cost _{reagent}		\$0.85 /gal
Initial Catalyst and Chemicals, I = 0 (for SNCR)		0
Total Capital Investment, TCI = D + E + F + G + H + I		<u>\$1,962,561</u>
Annual Costs:		
<u>Direct Annual Costs</u>		
Operating and Supervisor Labor (assumed for SNCR = 0)		0
Maintenance	0.015*TCI	\$29,438
Reagent Consumption (t _{op} assumed to 8,760 hr/yr)	q _{sol} Cost _{reagent} t _{op}	\$790,698
mass flow rate of reagent (m _{reag})		503.91 lb/hr
mass flow rate of solution (m _{sol})		1,007.83 lb/hr
q _{sol} = m _{sol} * ρ / 71.0 lb/ft ³		106.19 gph
Utilities, P = (0.47*NO _{x in} *NSR*Q _B) / 9.5		50.1 kW
NSR = [(2 * NO _{x uncontrolled})+0.7]*η _{NO_x} / NO _{x uncontrolled}		1.93
Annual electricity cost	P*Cost _{elect} *t _{op}	\$43,917
Cost _{elect}		0.10 \$/kW
<u>Water Consumption</u>		
Water flow rate, q _{water} = 4 * m _{sol} /ρ _{water}		483.08 gph
Annual water cost = q _{water} *Cost _{water} (\$0.0004/gal)*t _{op}		\$1,692.72
<u>Coal and Ash</u>		
Coal (MMBtu/hr) = (900 Btu/lb * m _{reagent} (lb/hr) * 9) / 10 ⁶ (Btu/MMBtu)		4.08 MMBtu/hr
Ash = [Coal (MMBtu/hr) * 0.077 * 10 ⁶ Btu/MMBtu] / 10,000 Btu/lb		31.43 lb/hr
Ash _{cost} = Ash (MMBtu/hr) x \$11.28/ton x 8,760 hr/yr / 2,000 lb/ton		\$1,553 /yr
Coal _{cost} = Coal (MMBtu/hr) x \$1.6/MMBtu x 8,760 hr/yr		\$57,209 /yr
Annual Coal & Ash Cost =		\$58,762

Table 2. Economical Analysis for SNCR for NO_x Control from a Cement Kiln

Cost Item	Factor	Total Cost
<u>Indirect Annual Costs</u>		
Capital Recovery Factor (assuming 7% interest rate and 20 years economic life)	0.09439	
Indirect Annual Costs, IDAC = CRF*TCI		\$185,246
Total Annual Cost, TAC = DC + IDAC		\$1,574,028
Tons of NO _x removed		1,752 tons
Cost Efficiency		\$898 /ton

^a Based on AP-42 Table 11.6-8 Portland Cement Manufacturing for a Preheater/Preheater/Precalciner Kiln and a clinker production rate of 125 TPH.

Source: EPA's Cost Control Manual (January 2002).

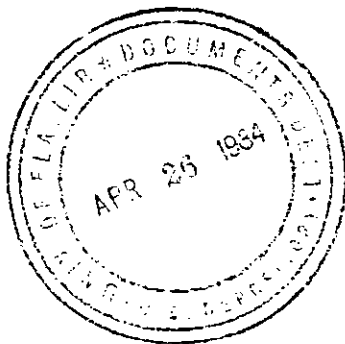
August 3, 2005 Letter to A.A. Linero – Response to RAI
Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 3
USGS Data – Element Concentrations

COPY

Element Concentrations in Soils and
Other Surficial Materials of the
Conterminous United States

U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER 1270



557.3

U582 p

no. 1270

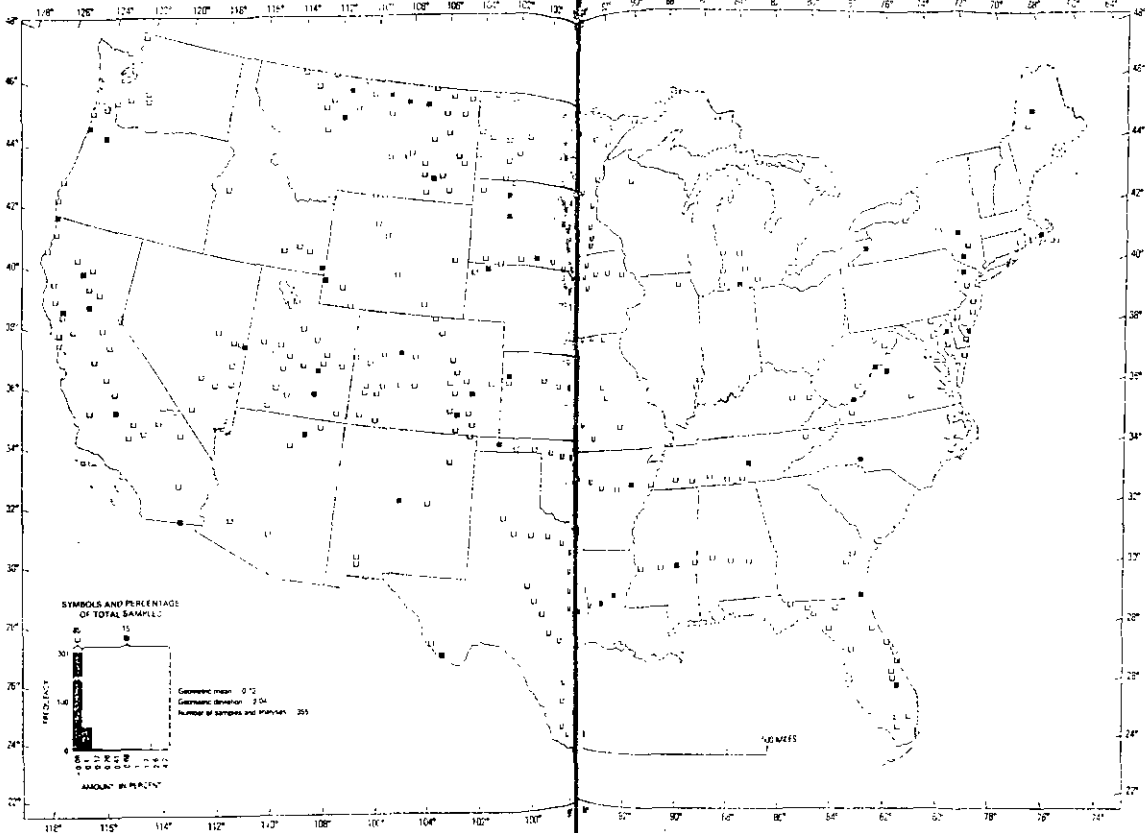


FIGURE 38 — Sulfur content of surficial materials.

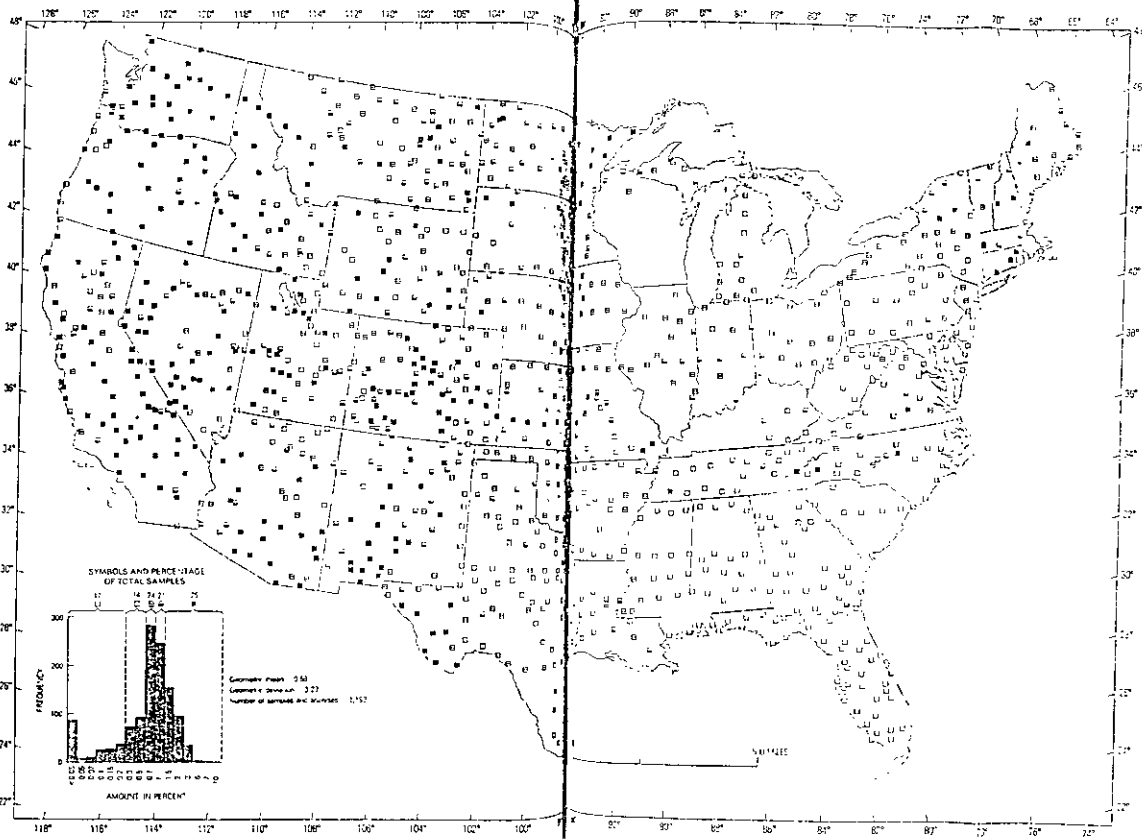
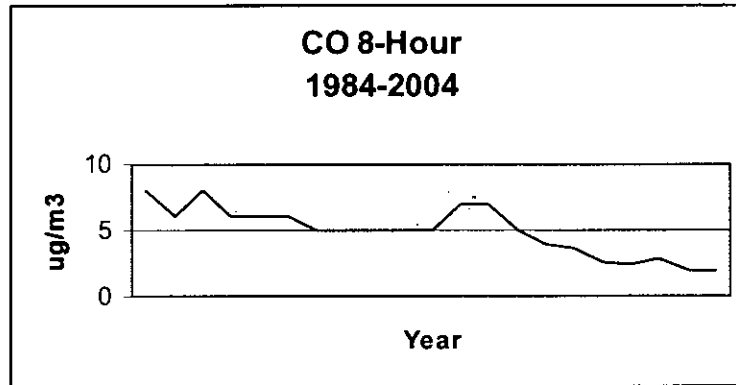
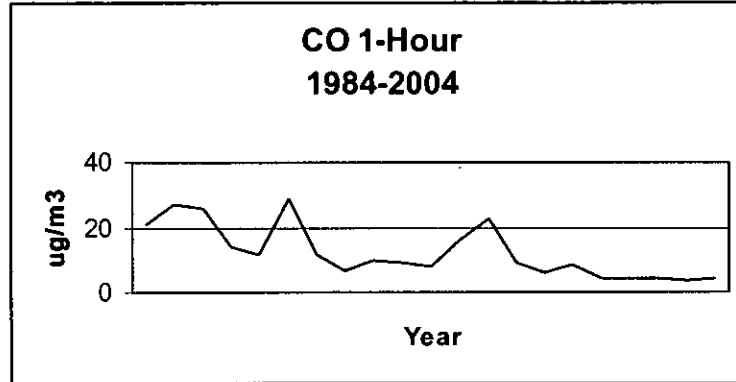


FIGURE 36.—Sulfur content of surficial materials.

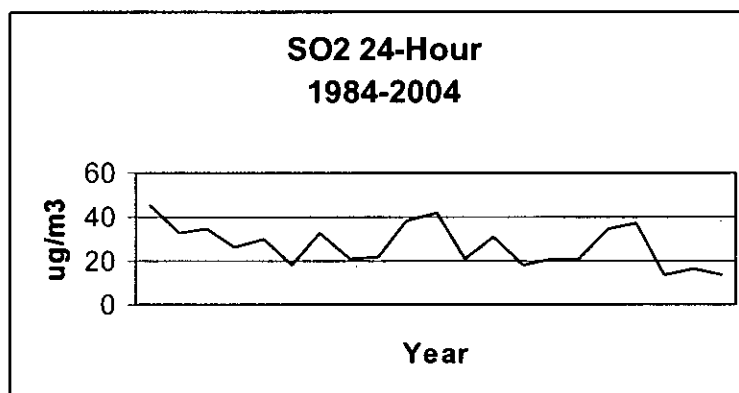
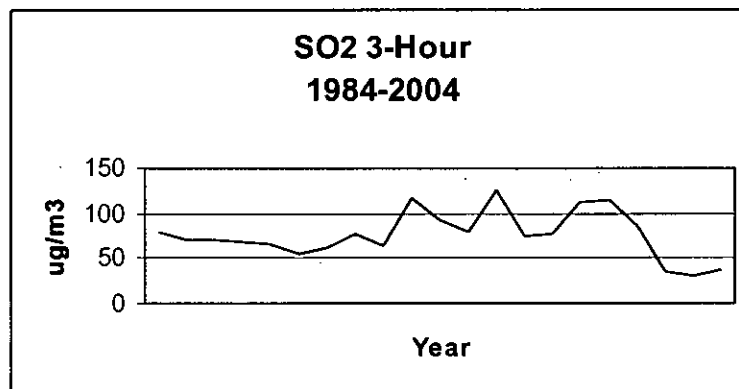
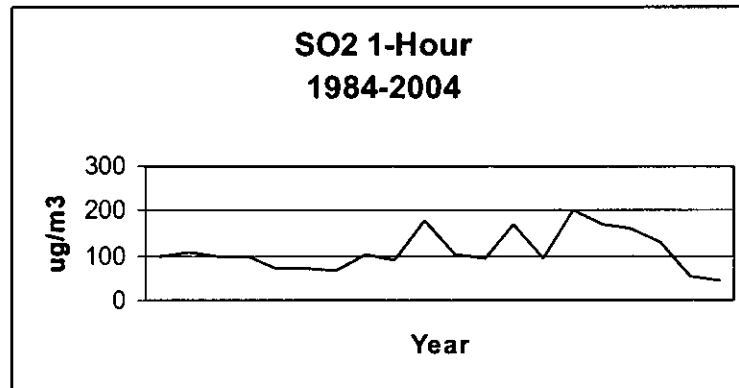
August 3, 2005 Letter to A.A. Linero – Response to RAI
Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 4
Ambient Concentration Charts

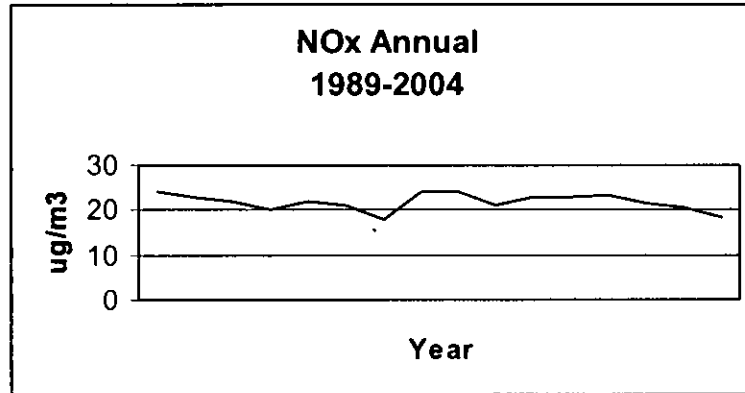
Carbon Monoxide
Orange County
Central Avenue, Orlando



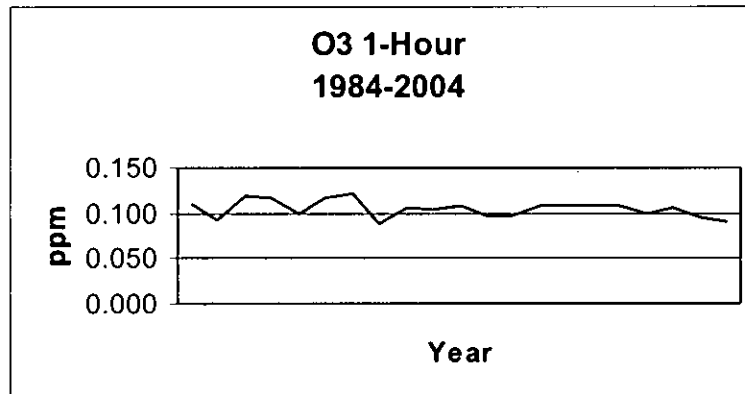
Sulfur Dioxide
Orange County
Winter Park



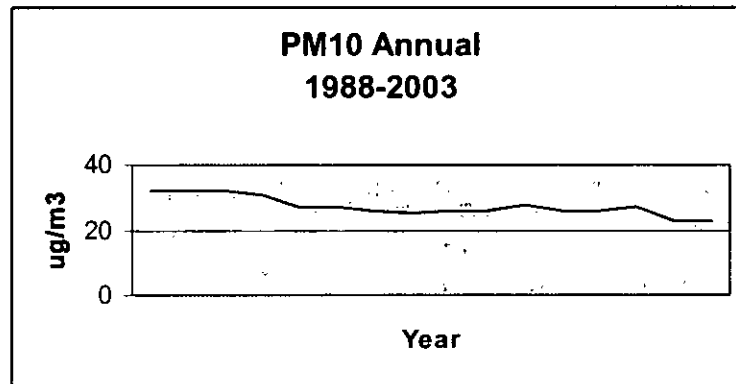
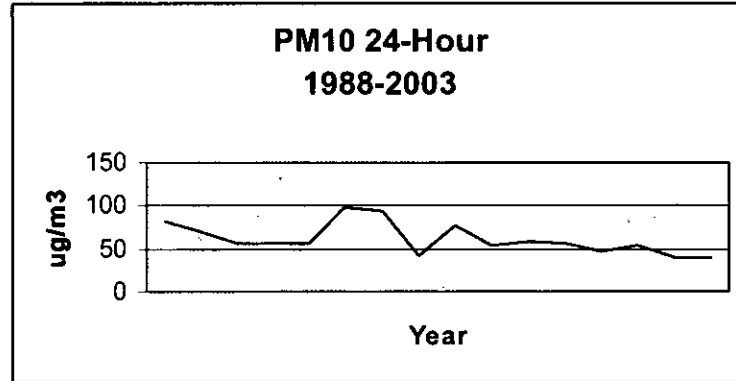
Nitrogen Dioxide
Orange County
Winter Park



Ozone
Orange County
Winter Park

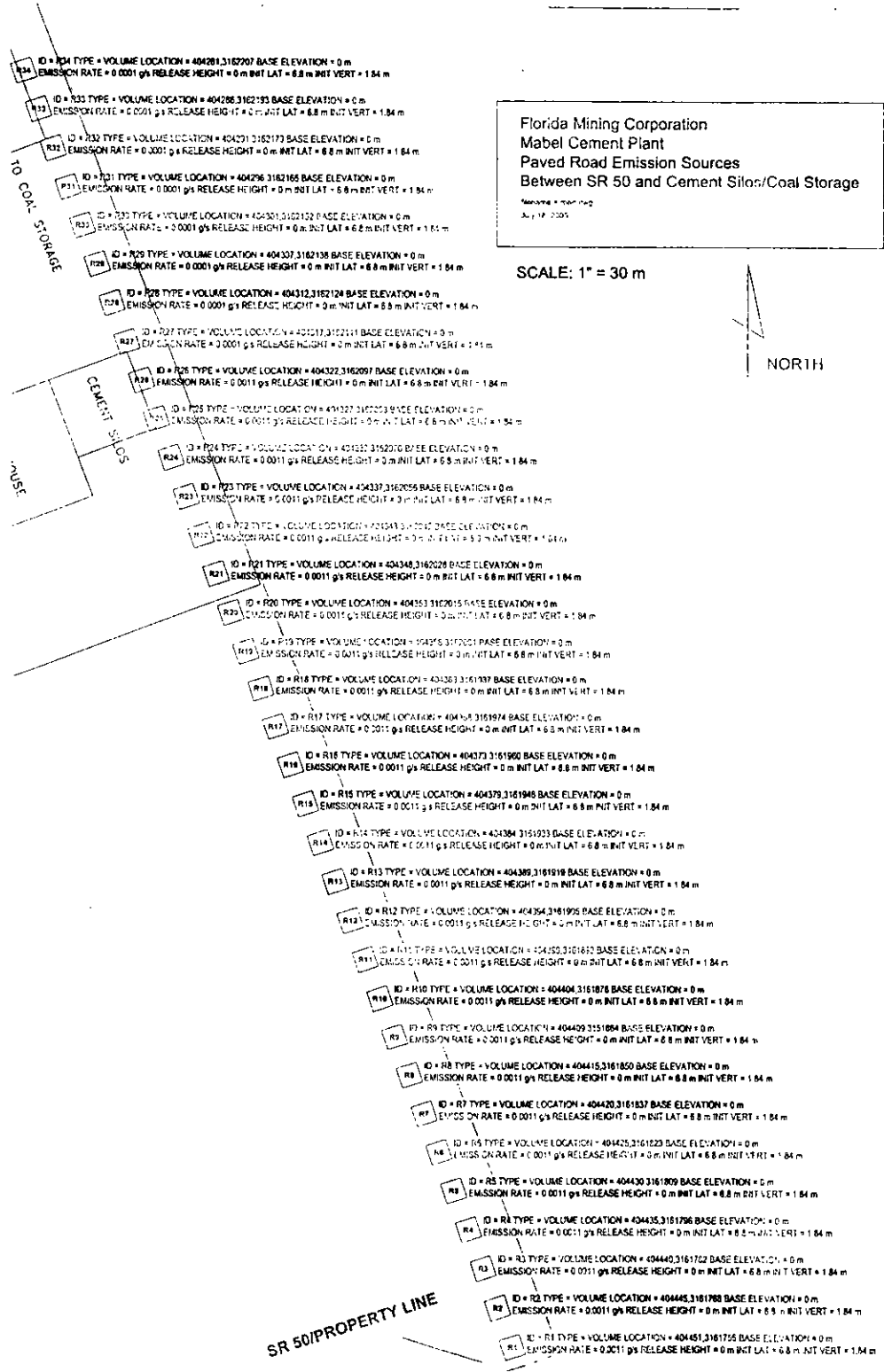


Particulate Matter (PM₁₀)
Orange County
West 33rd St., Orlando



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Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 5
Road Source Diagram



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Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 6
Revised Plot Plan

August 3, 2005 Letter to A.A. Linero – Response to RAI
Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 7
Sumter County General Soils Map

August 3, 2005 Letter to A.A. Linero – Response to RAI
Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 8
Florida Natural Areas Inventory

FNAI tracking list

SUMTER COUNTY

75 Total Elements Found
 Last Updated: April 2005

Key

Scientific Name is linked to the FNAI Online Field Guides when available.

 - links to **NatureServe Explorer**, an online encyclopedia of more than 55,000 plants, animals, and natural communities in North America, compiled by the **NatureServe** network of natural heritage programs, of which the Florida Natural Areas Inventory is a member.


 - links to a species distribution map (**Adobe SVG viewer** required). If your browser does not support Adobe SVG, try this [link](#)

New Search

SEARCH RESULTS









Other Elements

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Bird Rookery</i>		GNR	SNR	N	N

Amphibians

EXPLANATION

Scientific Name		Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Ambystoma tigrinum</i>	 	Tiger Salamander	G5	S3	N	N
<i>Notophthalmus perstriatus</i>	 	Striped Newt	G2G3	S2S3	N	N
<i>Pseudobranchius striatus lustricolus</i>	 	Gulf Hammock Dwarf Siren	G5T1	S1	N	N
<i>Rana capito</i>	 	Gopher Frog	G3	S3	N	LS

Reptiles







































EXPLANATION

Scientific Name		Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Alligator mississippiensis</i>	 	American Alligator	G5	S4	SAT	LS
<i>Crotalus adamanteus</i>	 	Eastern Diamondback Rattlesnake	G4	S3	N	N
<i>Drymarchon couperi</i>	 	Eastern Indigo Snake	G3	S3	LT	LT
<i>Gopherus polyphemus</i>	 	Gopher Tortoise	G3	S3	N	LS
<i>Heterodon simus</i>	 	Southern Hognose Snake	G2	S2	N	N
<i>Pituophis melanoleucus mugitus</i>	 	Florida Pine Snake	G4T3?	S3	N	LS
<i>Pseudemys concinna suwanniensis</i>	 	Suwannee Cooter	G5T3	S3	N	LS
<i>Stilosoma extenuatum</i>	 	Short-tailed Snake	G3	S3	N	LT

Birds

EXPLANATION














Scientific Name		Common Name	Global Rank	State Rank	Federal Status	State Status
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<i>Accipiter cooperii</i>			Cooper's Hawk	G5	S3	N	N
<i>Aimophila aestivalis</i>			Bachman's Sparrow	G3	S3	N	N
<i>Aphelocoma coerulescens</i>			Florida Scrub-jay	G2	S2	LT	LT
<i>Aramus guarauna</i>			Limpkin	G5	S3	N	LS
<i>Ardea alba</i>			Great Egret	G5	S4	N	N
<i>Athene cunicularia floridana</i>			Florida Burrowing Owl	G4T3	S3	N	LS
<i>Buteo brachyurus</i>			Short-tailed Hawk	G4G5	S1	N	N
<i>Egretta caerulea</i>			Little Blue Heron	G5	S4	N	LS
<i>Egretta thula</i>			Snowy Egret	G5	S3	N	LS
<i>Egretta tricolor</i>			Tricolored Heron	G5	S4	N	LS
<i>Elanoides forficatus</i>			Swallow-tailed Kite	G5	S2	N	N
<i>Eudocimus albus</i>			White Ibis	G5	S4	N	LS
<i>Falco columbarius</i>			Merlin	G5	S2	N	N
<i>Falco peregrinus</i>			Peregrine Falcon	G4	S2	N	LE
<i>Falco sparverius paulus</i>			Southeastern American Kestrel	G5T4	S3	N	LT
<i>Grus canadensis pratensis</i>			Florida Sandhill Crane	G5T2T3	S2S3	N	LT
<i>Haliaeetus leucocephalus</i>			Bald Eagle	G4	S3	LT,PDL	LT
<i>Ixobrychus exilis</i>			Least Bittern	G5	S4	N	N
<i>Laterallus jamaicensis</i>			Black Rail	G4	S2	N	N

<i>Mycteria americana</i>	 	Wood Stork	G4	S2	LE	LE
<i>Nyctanassa violacea</i>	 	Yellow-crowned Night-heron	G5	S3	N	N
<i>Nycticorax nycticorax</i>	 	Black-crowned Night-heron	G5	S3	N	N
<i>Pandion haliaetus</i>	 	Osprey	G5	S3S4	N	LS*
<i>Picoides villosus</i>	 	Hairy Woodpecker	G5	S3	N	N
<i>Plegadis falcinellus</i>	 	Glossy Ibis	G5	S3	N	N



Mammals

EXPLANATION

Scientific Name		Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Corynorhinus rafinesquii</i>	 	Rafinesque's Big-eared Bat	G3G4	S2	N	N
<i>Mustela frenata peninsulæ</i>	 	Florida Long-tailed Weasel	G5T3	S3	N	N
<i>Myotis austroriparius</i>	 	Southeastern Bat	G3G4	S3	N	N
<i>Neofiber alleni</i>	 	Round-tailed Muskrat	G3	S3	N	N
<i>Podomys floridanus</i>	 	Florida Mouse	G3	S3	N	LS
<i>Sciurus niger shermani</i>	 	Sherman's Fox Squirrel	G5T3	S3	N	LS
<i>Ursus americanus floridanus</i>	 	Florida Black Bear	G5T2	S2	N	LT*

































Gastropods (Snails and Allies)

EXPLANATION

Scientific Name		Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Aphaestracon xynoelictum</i>	 	Fenney Springs Hydrobe	G1	S1	N	N

Plants

EXPLANATION

Scientific Name		Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Asplenium plenum</i>	 	Ruffled spleenwort	G1Q	S1	N	N
<i>Asplenium verecundum</i>	 	Modest Spleenwort	G1	S1	N	LE
<i>Asplenium x curtissii</i>	 	Curtiss' Spleenwort	G1	S1	N	N
<i>Centrosema arenicola</i>	 	Sand Butterfly Pea	G2Q	S2	N	LE
<i>Dicerandra cornutissima</i>	 	Longspurred Mint	G1	S1	LE	LE
<i>Digitaria gracillima</i>	 	Longleaf Crabgrass	G1	S1	N	N
<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	 	Scrub Buckwheat	G4T3	S3	LT	LE
<i>Justicia cooleyi</i>	 	Cooley's Water-willow	G2	S2	LE	LE
<i>Matelea floridana</i>	 	Florida Spiny-pod	G2	S2	N	LE
<i>Pecluma plumula</i>	 	Plume Polypody	G5	S2	N	LE
<i>Pecluma ptilodon</i>	 	Swamp Plume Polypody	G5?	S2	N	LE
<i>Peperomia humilis</i>	 	Terrestrial Peperomia	G5	S2	N	LE
<i>Spigelia loganioides</i>	 	Pinkroot	G2Q	S2	N	LE
<i>Trichomanes petersii</i>	 	Peters' Bristle Fern	G4G5	S1S2	N	N
<i>Trichomanes punctatum</i> ssp. <i>floridanum</i>	 	Florida Filmy Fern	G4G5T1	S1	N	LE
<i>Triphora craigheadii</i>	 	Craighead's Nodding-caps	G1	S1	N	LE
		Rickett's Nodding-caps	G1?	S1	N	N



Natural Communities		DESCRIPTION		EXPLANATION			
Scientific Name		Common Name		Global Rank	State Rank	Federal Status	State Status
<i>Basin marsh</i>				G4	S4	N	N
<i>Basin swamp</i>				G4	S3	N	N
<i>Baygall</i>				G4	S4	N	N
<i>Bottomland forest</i>				G4	S3	N	N
<i>Floodplain forest</i>				G4	S3	N	N
<i>Floodplain swamp</i>				G4	S4	N	N
<i>Mesic flatwoods</i>				G4	S4	N	N
<i>Scrub</i>				G2	S2	N	N
<i>Spring-run stream</i>				G2	S2	N	N
<i>Terrestrial cave</i>				G3	S2	N	N
<i>Upland hardwood forest</i>				G5	S3	N	N
<i>Upland mixed forest</i>				G4	S4	N	N

New Search

explanations and definitions



Element & element occurrence

An **element** is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. An **element occurrence (EO)** is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Ranking system

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The **global rank** is based on an element's worldwide status; the **state rank** is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

- **FNAI Global Rank**
- **FNAI State Rank**
- **Federal Status**
- **State Status**
- **Special Animal Listings**

FNAI GLOBAL RANK DEFINITIONS

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some

natural or man-made factor.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

G4 = Apparently secure globally (may be rare in parts of range).

G5 = Demonstrably secure globally.

GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).

GX = Believed to be extinct throughout range.

GXC = Extirpated from the wild but still known from captivity or cultivation.

G#? = Tentative rank (e.g., G2?).

G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).

G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).

G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).

G#T#Q = Same as above, but validity as subspecies or variety is questioned.

GU = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).

GNA = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).

GNR = Element not yet ranked (temporary).

GNRTNR = Neither the element nor the taxonomic subgroup has yet been ranked.

FNAI STATE RANK DEFINITIONS

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

S4 = Apparently secure in Florida (may be rare in parts of range).

S5 = Demonstrably secure in Florida.

SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).

SX = Believed to be extirpated throughout Florida.

SU = Unrankable; due to a lack of information no rank or range can be assigned.

SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).

SNR = Element not yet ranked (temporary).

FEDERAL LEGAL STATUS

Provided by FNAI for information only.

For official definitions and lists of protected species, consult the relevant federal agency.

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

LE Endangered: species in danger of extinction throughout all or a significant portion of its range.

- LT** Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
- LT,PDL** Species currently listed threatened but has been proposed for delisting.
- SAT** Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
- PE** Proposed for listing as Endangered species.
- PT** Proposed for listing as Threatened species.
- C** Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
- XN** Non-essential experimental population.
- SC** Not currently listed, but considered a "species of concern" to USFWS.
- N** Not currently listed, nor currently being considered for listing as Endangered or Threatened.

STATE LEGAL STATUS

Provided by FNAI for information only.
For official definitions and lists of protected species, consult the relevant federal agency.

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

- LE** Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
- LT** Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
- LS** Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
- PE** Proposed for listing as Endangered.
- PT** Proposed for listing as Threatened.
- PS** Proposed for listing as Species of Special Concern.
- N** Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes,

and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see:
<http://doacs.state.fl.us/~pi/5b-40.htm#.0055>.

LE Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.

LT Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.

PE Proposed for listing as Endangered.

PT Proposed for listing as Threatened.

N Not currently listed, nor currently being considered for listing.

SPECIAL ANIMAL LISTINGS - STATE AND FEDERAL STATUS

Grus americana (whooping crane) - Federally listed as XN (nonessential experimental population) which refers to the Florida experimental population only; Federal listing elsewhere is LE.

Pandion haliaetus (osprey) - State listed as LS (Species of Special Concern) in Monroe county only; not listed in rest of state.

Mustela vison mink pop1 (southern mink, S. Florida population) - State listed as LT (Threatened) which refers to the Everglades population only; species formerly listed as *Mustela vison evergladensis*.



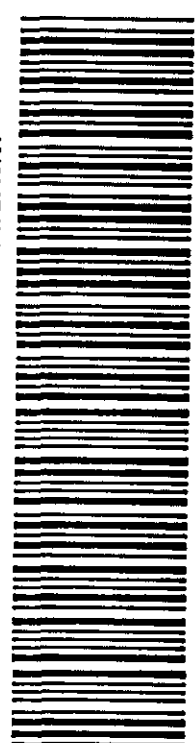
Ursus americanus floridanus (Florida black bear) - State listed as LT but not applicable in Baker and Columbia counties or the Apalachicola National Forest.



FNAI - Florida Natural Areas Inventory
Florida Resources and Environmental Analysis Center
1018 Thomasville Road, Suite 200-C
Tallahassee, Florida 32303
Phone: (850) 224-8207
Fax: (850) 681-9364
Contact_us
Photo Credits

August 3, 2005 Letter to A.A. Linero – Response to RAI
Florida Mining Corporation – Mabel Cement Plant

ATTACHMENT 9
CD with Dispersion and Deposition Files

		EXP		Parcels: 1/1
Front DEP AIR RESOURCE MGMT P. Adams DIRECTOR OFFICE STE 23 111 S MAGNOLIA DR TALLAHASSEE, FL 32301 UNITED STATES Tel: 850-921-9505		37550201000 A7 AP255 Sender's ref TLH		ORIGIN: TLH
To: U.S. EPA Region 4 Mr. Gregg M. Worley Air Permits Section Atlanta, GA 30303 UNITED STATES		POSTCODE: 30303		Tel: 404-562-9141
Description: PSD-FL-356 letter				
Weight: 1 lbs for 1 pcs Date: 2005-08-11				
DHL standard terms and conditions apply.				
		HARB 6V ATT		
(ZLUS930303)				
WAYBILL: 27412609556 (Non-Negotiable)				

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Using a photocopy could delay the delivery of your package and will result in additional shipping charge

SENDER'S RECEIPT
 Waybill #: 27412609556

To (Company):
 U.S. EPA Region 4
 Air Permits Section
 61 Forsyth Street

Atlanta, GA 30303
 UNITED STATES

Attention To: Mr. Gregg M. Worley
 Phone#: 404-562-9141

Sent By: P. Adams
 Phone#: 850-921-9505

Rate Estimate: 6
 Protection: Not Required
 Description: PSD-FL-356 letter

Weight (lbs.): 1
 Dimensions: 0 x 0 x 0

Ship Ref: 37550201000 A7 AP255
 Service Level: Next Day 1200 (Next business day by 12 PM)


Special Svc:

Date Printed: 8/11/2005
 Bill Shipment To: Sender
 Bill To Acct: 778941286

DHL Signature (optional) _____ Route _____ Date _____ Time _____

For Tracking, please go to www.dhl-usa.com or call 1-800-225-5345


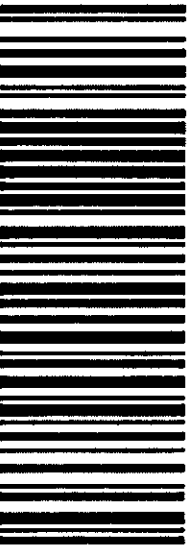

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		EXP		Parcels: 1/1
Front DEP AIR RESOURCE MGMT P. Adams DIRECTOR OFFICE STE 23 111 S MAGNOLIADR TALLAHASSEE, FL 32301 UNITED STATES Tel: 850-921-9505		37550201000 A7 AP255 Sender's ref:		ORIGIN: TLH
To: National Park Service Mr. John Buryak 12795 W. Alameda Parkway Air Division Lakewood, CO 80228 UNITED STATES		POSTCODE: 80228		Tel: 303-966-2818
Description: PSD-FL-356 letter		Weight: 1 lbs for 1 pcs Date: 2005-08-11 DHL standard terms and conditions apply.		
		EGEH 8E		
(2L)US80228				
WAYBILL: 27412306751 (Non-Negotiable)				

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SENDER'S RECEIPT

Waybill #: 27412306751

To (Company):
National Park Service
Air Division
12795 W. Alameda Parkway

Lakewood, CO 80228
UNITED STATES

Attention To: Mr. John Buryak
Phone #: 303-966-2818

Sent By: P. Adams
Phone #: 850-921-9505

Rate Estimate: 12.51
Protection: Not Required
Description: PSD-FL-356 letter

Weight (lbs.): 1
Dimensions: 0 x 0 x 0

Ship Ref: 37550201000 A7 AP255
Service Level: Next Day 12:00 (Next business day by 12 PM)

Special Svc:
Date Printed: 8/11/2005
Bill Shipment To: Sender
Bill To Acct: 778941286

DHL Signature (optional) _____ Route _____ Date _____ Time _____

For Tracking, please go to www.dhl-usa.com or call 1-800-225-5345
Thank you for shipping with DHL

