

## REQUEST FOR MODELING ANALYSIS

### I. ENGINEERING INPUT

- Engineer Requesting: **Steve Neadow** Date: **October 18, 2007**
- Emissions/Process Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_
- Desired Modeling Completion Date: **March 15, 2007**
- Project type(s): PSD **X**; Toxics **X**; Quarry \_\_\_\_\_; BART \_\_\_\_\_
- Permit Reference Number: **3255-261-0047-V-04-0**

#### A. Source Information (Engr)

- Facility Name: **C-E Minerals Plant 2**
- Location(City &/or County): Andersonville (Sumter County)
- Criteria Pollutants emitted in significant amounts (tpy):

PROJECT:	NO <sub>x</sub> <u>482.23</u> *	PLANT-WIDE: NO <sub>x</sub> <b>X</b>
	SO <sub>2</sub> <u>39</u> *	SO <sub>2</sub> <b>X</b>
	PM <sub>10</sub> <u>109.37</u> *	PM <sub>10</sub> <b>X</b>
	CO <b>X</b>	CO <b>X</b>
	VOC <b>X</b>	VOC <b>X</b>
	Lead _____	Lead _____
	H <sub>2</sub> SO <sub>4</sub> <b>X</b>	H <sub>2</sub> SO <sub>4</sub> <b>X</b>

\* Visibility-affecting pollutant

- Date emission data verified? \_\_\_\_\_
- NAAQS and Increment have explicit pollutant-specific time-weighted averaging periods. If the project is to have short-term emission rates that differ from annual emission rates presented above (divided by the applicable time-weighting averaging period), please attach such information (in lbs/hr of pollutants with rates other than annual). Example: If maximum hourly rate not = to annual rate/8760 hrs-per-year X 2000 pounds-per-ton, then what is maximum hourly rate, etc.?
- Is data provided sufficient to accurately inventory the PSD Increment? **YES**
- Attach plot plan of the facility that shows property lines, building locations and emission points, & receptor locations.
- **ATTACH MODELING CD OR FILES!**

### B. Background Information (Engr.)

- PSD baseline dates: SO<sub>2</sub> 7/2/80 PM10 7/2/80 NO<sub>2</sub> 8/9/07
- Modeling to be conducted for: PSD Increment Class I:   , Class II: **x**  
NAAQS **x** , Preconstruction monitoring   **x**  , BART Visibility
- If there are Class I areas within 200 km of the source, OR if Q/D > 4, where  
Q= tpy of visibility-affecting pollutants to be emitted by the project,  
and D= facility-to-Class I Area distance (km):
- distance to **Okefenokee** area(s) is   **210**   km.  
distance to **St. Marks** area(s) is   **>210**   km.  
distance to **Bradwell Bay** area(s) is   **>210**   km.  
distance to **Wolf Is.** area(s) is   **>210**   km.
- Is modeling to include fugitive emissions: **YES** (Yes/No)? If yes,  
are fugitive emissions adequately characterized in report? **NO** (Yes/No)?
- If any actual stack height is less than its GEP stack height, attach BPIP  
model output table (provided by applicant).
- Are            emission            rates            modeled            allowable            limits?
- 
- Periods of operation if other than 24 hours/day, 7 days/week: **None**
- Are complex terrain issues identified or considered in the report? **YES**
- If VOC emissions are to increase by more than 100 tpy, is an ozone impacts  
analysis included in the application? **N/A**
- Are Class II visibility issues addressed? **YES**
- Are additional impacts (soils, vegetation, & growth) addressed? **YES**
- Remarks or additional information:

CE Minerals, '07 Class I Impacts Assessment

State road map (2004) indicates 3.375 inches represent 40 miles. Okeefenokee is the closest Class I area to site. Ruler indicates 11 inches between Andersonville and Okeefenokee.  $11'' / 3.375'' \times 40 \text{ mi} \times 5280 \text{ ft/mi} / 3280 \text{ ft/km} = 210 \text{ km} (= d)$ .

Total visibility affecting emissions of Net Project =  
482.23 tpyNOx + 109.37 tpy PM10 + 39 tpy SO2 =  
630.6 Total Project Visibility Affecting Emissions (TPVAE, = Q)

$$630.6 \text{ TPVAE} / 210 \text{ km} = Q/d = 3.002$$

3.002 <<< 10 = Q/d proposed FLM interest threshold,  
therefore, Project is not expected to be of interest to the FLMs  
Since the distance to the nearest Class I area exceeds 200 km, there is no  
requirement to evaluate Class I Increment consumption.

II. INITIAL {Significance Test} MODELING RESULTS (project emissions only!)

- Date completed 4/3/08 By PSC

TABLE II-1 PROJECT IMPACTS VS. SIGNIFICANCE LEVEL (CLASS I AREAS)

Criteria Pollutant	Averaging Period	Significance Level	Maximum* Project Concentration	Receptor UTM Zone: _____		Model Met Data Period
		( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	X (m)	Y (m)	[yyymmddhh]
SO <sub>2</sub>	Annual	0.1				
	24-Hour	0.2				
	3-Hour	1.0				
PM <sub>10</sub>	Annual	0.2				
	24-Hour	0.3				
NO <sub>2</sub>	Annual	0.1				

\*Highest concentration - = ALL averaging periods

TABLE II-2 PROJECT IMPACTS VS. SIGNIFICANCE LEVEL (CLASS II AREAS)

Criteria Pollutant	Averaging Period	Significance Level	Maximum* Highest Project Concentration	Receptor UTM Zone: <u>16</u> _____		Model Met Data Period	Significant Impact Distance
		( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	X (m)	Y (m)	[yyymmddhh]	(km)
SO <sub>2</sub>	Annual*	1					
	24-Hour*	5					
	3-Hour*	25					
PM <sub>10</sub>	Annual*	1	2.86	770193	3564300	1987	<b>1.8 km</b>
	24-Hour*	5	12.55	770193	3564300	91020524	<b>2.6 km</b>
NO <sub>2</sub>	Annual*	1	1.86	771558	3564722	1990	<b>0.8 km</b>
CO	8-Hour*	500					
	1-Hour*	2000					

\*Highest concentration = ALL averaging periods

- IF MAXIMUM PROJECTED CONCENTRATION EXCEEDS THE SIGNIFICANCE LEVEL FOR ANY AVERAGING PERIOD, REFINED NAAQS/INCREMENT ANALYSIS IS REQUIRED FOR THAT POLLUTANT.
- Maximum Significant Impact Distances used to define pollutant-specific modeling areas indicated in **Bold font**.

Source CE Minerals Kiln 6 + contemporaneous sources

TABLE II-3 PROJECT POLLUTANT MONITORING *DE MINIMIS* IMPACTS

Pollutant	Avg. Period	De Minimus Concentration	Projected* Concentration	Receptor UTM Zone: <u>16</u>		Model Met Data Period
		( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	X (m)	Y (m)	(yyymmddhh)
CO	8-Hour	575				
NO <sub>2</sub>	Annual	14	1.86	771558	3564722	1990
PM <sub>10</sub>	24-Hour	10	12.55	770193	3564300	91020524
SO <sub>2</sub>	24-Hour	13				
Pb	3-Month	0.1				
F1	24-Hour	0.25				
Total Reduced S	1-Hour	10				
H <sub>2</sub> S	1-Hour	0.2				
Reduced S Compounds	1-Hour	10				

\*Highest concentration off property

- AUTOMATIC EXCLUSION FROM PRECONSTRUCTION MONITORING IF PROJECTED CONCENTRATION LESS THAN *DE MINIMIS*. NO<sub>2</sub>-yes; PM<sub>10</sub>-no (Yes/No)
- Model(s) used: AERMOD (07026)
- Meteorological data: Year(s) 1987-90 Surface data from Macon Reg. Airport NWS
  - Upper air data from Centreville, AL
- Exemption information: NO<sub>2</sub> exempt  
PM<sub>10</sub> not exempt, will rely on GA EPD monitoring
- Remarks or additional information: \_\_\_\_\_

Receptor Grid: 100-m spaced to 2 km from source

500-m spaced to 5 km from source

1000-m spaced to 10 km from source

### III. FINAL MODELING RESULTS - PSD INCREMENT

TABLE III-1 CLASS I AREA INCREMENT ASSESSMENT- ALL RELEVANT SOURCES

Pollutant	Averaging Period	Allowable Increment	Maximum* Increments Consumed	Receptor UTM Zone: <u>16</u>		Model Met Data Period
		(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )	X (m)	Y (m)	yymmddhh
SO <sub>2</sub>	Annual	2				
	24-Hour	5				
	3-Hour	25				
PM <sub>10</sub>	Annual	4				
	24-Hour	8				
NO <sub>2</sub>	Annual	2.5				

\*Off property concentrations:

Highest concentration: annual averaging periods

Highest, second highest concentration: 24-hour and 3-hour averaging periods

- Models used: \_\_\_\_\_  
 - Meteorological data: Year(s) \_\_\_\_\_  
 - Surface data from \_\_\_\_\_  
 - Upper air data from \_\_\_\_\_  
 - Fugitive emissions included in model? \_\_\_\_\_  
 - Remarks or additional information: \_\_\_\_\_

TABLE III-2 CLASS II AREA PSD INCREMENT ASSESSMENT, ALL RELEVANT SOURCES

Pollutant	Averaging Period	Allowable Increment	Maximum* Increment s Consumed	Receptor UTM Zone <u>16</u>		Model Met Data Period
		( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	X (m)	Y (m)	(yyymmddhh)
SO <sub>2</sub>	Annual	20				
	24-Hour	91				
PM <sub>10</sub>	3-Hour	512				
	Annual	17	9.45	775950	3572108	1988
NO <sub>2</sub>	24-Hour	30	28.78	770193	3564360	89032824
	Annual	25	2.6	771654	3564722	1989

\*Off property concentrations:

Highest concentration: annual averaging periods

Highest, second highest concentration: 24-hour and 3-hour averaging periods

- Models used: AERMOD (07026)
- Meteorological data: Year(s) 1987-91
- Surface data from Macon Regional Airport NWS
- Upper air data from Centreville, Alabama
- Fugitive emissions included in model? YES
- Remarks or additional information: \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

IV. Final Modeling Results - National Ambient Air Quality Standards (NAAQS)  
 Source CE Minerals Kiln 6 + contemporaneous sources

TABLE IV-1 PROJECTED IMPACT - NAAQS

Pollutant	Averaging Period	All Source Impact	Total* Impact	NAAQS	Receptor UTM Zone: <u>16</u>		Model Met Data Period
		( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	X (m)	Y (m)	(yyymmddhh)
SO <sub>2</sub>	Annual			80			
	24-Hour			365			
	3-Hour			1300			
PM <sub>10</sub>	Annual			50			
	24-Hour	19.85	39.85	150	770193	3564300	1987
		94.16	132.16		771558	3564722	89072124
NO <sub>2</sub>	Annual	20.45	34.45	100	771558	3564722	1989
CO	8-Hour			10,000			
	1-Hour			40,000			
Pb	3-Month			1.5			

\*Total impact equals source impact, plus impact from offsite sources, plus background

Background Concentrations ( $\mu\text{g}/\text{m}^3$ )				
Averaging Period	SO <sub>2</sub>	PM <sub>10</sub>	NO <sub>2</sub>	CO
Annual	**	20	14	**
24-Hour	**	38	-	-
8-Hour	-	-	-	**
3-Hour	**	-	-	-
1-Hour	-	-	-	**

- Origin(s) of other sources' emission data:  
 Actual emissions \_\_\_\_\_ Allowable emissions ✓ AIRS/EI02 \_\_\_\_\_, if yes has data been verified YES? Engineering review \_\_\_\_\_
- Have other sources been checked for GEP stack height? YES  
 No \_\_\_\_\_. Was actual ✓ or GEP \_\_\_\_\_ height used in the model?
- Model(s) used: AERMOD (07026)
- Meteorological data: Year(s) 1987-91 Surface data from MACON  
 Upper air data from CENTREVILLE, AL
- Computer summary of contributing sources attached NO (Yes/No)?
- Source of ambient concentrations GA EPD NETWORK

\*Off-property concentrations:

Highest concentration - annual averaging periods

Highest, second highest concentration - 24-hour - to - 1-hour averaging periods

V. CLASS II Visual Plume Model Results

Level I (VISCREEN) Analysis:

Distance ( $D_{vis}$ ) beyond which facility-wide emissions are predicted to cause no plume visible impacts under worst-case (F,1) conditions: 1KM ( <50 km)

List of sensitive receptors within the maximum Significant Impact Area between 1km and  $D_{vis}$  in any direction from the facility(National Parks & Class I Areas, State Parks & Historic Sites, airports, etc.):

<u>Sensitive Receptor</u>	<u>Closest Distance (km)</u>	<u>Azimuth from facility (°)</u>
<u>None</u>		

Level II (VISCREEN) Analysis:

Determination of Worst-case 1% Cumulative Frequency condition:

Year of Met Data: \_\_\_\_\_

Met condition (ie., F,2): \_\_\_\_\_

Sensitive Receptors not passing Level II (VISCREEN) Analysis: \_\_\_\_\_

Level III Analysis:

Sensitive Receptors not passing Level III (PLUVUE II) Analysis: \_\_\_\_\_

Mitigating criteria: \_\_\_\_\_