



**Environmental  
Protection Agency**

Ted Strickland, Governor  
Lee Fisher, Lt. Governor  
Chris Korleski, Director

Re: Seneca County  
Carmeuse Lime, Inc.  
Premise #0374000010  
Warning Letter

September 3, 2010

Ms. Stacey Rader, Environmental Manager  
Carmeuse Lime, Inc. - Maple Grove Operation  
1967 West County Road 42  
P. O. Box 708  
Bettsville, Ohio 44815

Dear Ms. Rader:

This letter shall serve to address the following areas:

- Request for BACT Analysis for the storage piles; please submit by 10/11/2010.
- PTI #P0104550 emission calculations; Please review by 10/11/2010.
- Failure to implement BACT control measures on storage piles.
- OAC rule 3745-15-04(A) requirement to conduct Method 9 observations during opacity monitor exceedances.

**BACT Analysis**

PTI #P0104550 is for the administrative modification of the facility storage piles (F002). It was determined that the facility's original PSD permit application, PTI #03-13527, inadequately addressed the storage piles at the facility. As a result, the original Best Available Control Technology (BACT) Analysis for the storage piles was also inadequate. Please submit a revised BACT Analysis that address all of the storage piles included in the current permit application. The BACT Analysis shall be prepared in accordance with U.S. EPA's 5-step, top-down approach and shall be submitted to NWDO for review by October 1, 2010.

**PTI #P0104550 Emission Calculations**

Northwest District Office (NWDO) has been working with Carmeuse Lime, Inc – Maple Grove to generate accurate emission calculations that reflect the company's material storage pile operations (emissions unit F002).

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Since the original receipt of the application in February 2009, the company has submitted numerous revisions to the calculations, which have all been determined to be technically incomplete. In an attempt to resolve this situation, NWDO has completed emission calculations based on information supplied by representatives of the company. In addition, the March 20, 1998, US EPA draft document entitled, "Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities" was used to estimate emissions from the company's lime kiln dust (LKD) storage piles and material handling operations.

Please note, NWDO calculated the emissions from the active LKD storage pile based on the controls proposed by U.S. EPA for cement kiln dust (CKD) handling and storage. It is our position that CKD and LKD are similar materials and there is no better emission data available for LKD. U.S. EPA has proposed the following control measures to adequately reduce or eliminate fugitive emissions from the handling and disposal of waste materials:

- Place the waste destined for temporary storage prior to recycling, sale, or disposal in tanks, containers, or buildings.
- Only emplace conditioned waste in the disposal area, or cover or otherwise manage the waste to control wind dispersal of dust.
- Cover the waste in the disposal area at the end of each operating day with material sufficient to prevent blowing dust.
- Alternative materials or actions may be approved provided the facility makes a demonstration that the alternative action(s) are sufficient to reduce or eliminate fugitive emissions.

NWDO did not assume the above controls for the other waste piles that are deposited in the quarry because the fugitive emissions, based on annual throughputs, were relatively low. However, NWDO is not implying that it is not necessary for Carmeuse to apply controls to the "temporary" waste piles prior to disposal in the quarry.

The validity of the calculations is based on the input data, which has changed considerably since the applicable was first received. Please review the enclosed calculations for accuracy and provide comments by October 11, 2010.

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### **Failure to Implement BACT Control Requirements on the Storage Piles**

NWDO has repeatedly expressed concern regarding whether or not Carmeuse employs BACT control requirements to prevent fugitive emissions from their material storage piles. Based on the current PTI application, subsequent information provided by the company, and our discussion with U.S. EPA, Region 5, it is our position that proper control measures were not proposed and/or are not being employed for the following piles:

- South kiln lime cleanout chute pile
- North kiln lime cleanout chute pile
- North cooling tower lime dust drop pile
- South cooling tower lime dust drop pile
- Temporary LKD pile (south of pug mill)
- Active LKD pile in quarry

In addition, it is questionable whether adequate control measures were proposed and/or have been implemented for the following piles:

- Coal pile
- Coke pile
- Sawdust pile
- Housekeeping dust pile (under truck load out support structure)

NWDO will review the company's revised BACT Analysis to determine whether the above piles have been adequately addressed.

### **OAC rule 3745-15-04(A) Request**

In accordance with OAC rule 3745-15-04(A), NWDO is immediately requesting that Carmeuse Lime, Inc perform a Method 9 observation at any time that the Continuous Opacity Monitor (COM) records two, consecutive 6-minute opacity exceedances from the rotary lime kilns, emissions units P003 and P004, while the kilns are in operation. One Method 9 observation shall continue to be performed each hour while one or both kilns are in operation until such time that the COM has not recorded an opacity exceedance for two (2) consecutive hours. In the event that the opacity monitor is not operational, Carmeuse shall perform Method 9 observations as proposed in their Start-up, Shutdown, Malfunction Plan prepared in accordance with MACT, Subpart AAAAA, dated January 25, 2007.

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The results of all Method 9 observations shall be maintained by the company for a minimum of five (5) years and shall be made available to the Director or Local Air Agency upon request. A summary of the Method 9 results shall be submitted with the company's quarterly deviation reports, if applicable.

If it is not possible to submit the items requested above by October 11, 2010, a letter indicating when the information will be available needs to be submitted in lieu of it. If no written response is received by October 11, 2010, the PTI application will be returned to the company.

Should you have any questions and/or comments regarding this letter, please contact me at (419) 373-3052 or by email at [andrea.odendahl@epa.state.oh.us](mailto:andrea.odendahl@epa.state.oh.us).

Sincerely,



Andrea M. Odendahl  
Division of Air Pollution Control

//lr

pc: DAPC-NWDO File  
NWDO Follow-Up File

ec: Lisa Potts, Carmeuse North America

**PERMIT REVIEW FORM**FACILITY NAME: Carmeuse Lime, Inc.  
APPLICATION NO.: 0374000010, F002; F004PTI NO.: P0104550  
INSTALLED: Admin. Modification**FACILITY**MAJOR (PSD): YES  
MAJOR (TITLE V): YES  
SYNTH. MINOR: NO**EMISSIONS UNIT**ACTUAL/ALLOWABLE >25 TPY: NO  
AIR TOXICS APPLY: NO  
REGISTRATION STATUS: NO**ALLOWABLE**STATE ENF.: YES  
FED ENF.: YES**INTRODUCTION:**

Carmeuse Lime maintains several piles that were not originally permitted and/or were not permitted accurately in the company's PSD permit application, PTI #03-13527. This permit will serve to administratively modify PTI #03-13527, issued 10/14/2003, to correct all permit deficiencies regarding the storage piles. OAC rule 3745-31-05(A)(3) [BAT] is an applicable rule; S.B. 265 does not apply to this permit.

NWDO disputes that Carmeuse employs BAT/BACT control measures on some of their storage piles. The company has been asked to prepare a revised BACT analysis to investigate this further.

**POTENTIAL EMISSIONS:****F002 MATERIAL STORAGE PILES**

	Pile Description	Control Method	Control Efficiency	Silt Content	Moisture Content
A	Limestone P112	High moisture content	Implied	2%	4%
B	Limestone P115	High moisture content	Implied	2%	4%
C	Coal	None	---	1%	6.5%
D	Coke	None	---	1%	6.5%
E	Cooling tower lime dust drop pile (hopper N of kilns)	High moisture content/sludge	90%	4%	1%
F	Cooling tower lime dust drop pile (hopper S of kilns)	High moisture content/sludge	90%	4%	1%
G	Small limestone pile #1 (north)	High moisture content	Implied	2%	4%
H	Small limestone pile #2 (south)	High moisture content	Implied	2%	4%
I	South kiln lime cleanout chute pile	None	---	4%	1%
J	North kiln lime cleanout chute pile	None	---	4%	1%
K	Temporary LKD pile (south of pug mill)	None	---	90%	1%

L	Active LKD quarry pile	Details Below			
M	Housekeeping dust pile under truck loadout support structure	Pug mill/ Enclosure	89% (implied) 35%	9.9%	3%
N	Sawdust pile	None	---	3%	1%

F002 - Emission Summary					
Pile	Tons/Year	*PE Factor Un/loading (# times)	Tons PE/Year	PM <sub>10</sub> Factor Un/loading (# times)	Tons PM <sub>10</sub> /Year
	Acres	Wind Erosion		Wind Erosion	
A**	865000 TPY	0.002 lb/ton (1)	0.87	0.001 lb/ton (1)	0.43
B**	2 ac.	4.70 lbs/day/acre	1.72	50% (PE)	0.86
C	40000 TPY	0.001 lb/ton (3)	0.06	0.0005 lb/ton (3)	0.03
	0.55 ac.	2.36 lbs/day/acre	0.24	50% (PE)	0.12
D	100000 TPY	0.001 lb/ton (3)	0.15	0.0005 lb/ton (3)	0.08
	0.1 ac.	2.36 lbs/day/acre	0.04	50% (PE)	0.02
E	10000 TPY	0.0014 lb /ton (3)***	0.02	0.001 lb/ton (3)**	0.01
	0.1 ac.	0.943 lbs/day/acre***	0.02	50% (PE)**	0.01
F	10000 TPY	0.0014 lb /ton (3)***	0.02	0.001 lb/ton (3)**	0.01
	0.1 ac.	0.943 lbs/day/acre***	0.02	50% (PE)**	0.01
G	20000 TPY	0.002 lb/ton (4)	0.08	0.001 lb/ton (4)	0.04
	0.1 ac.	4.70 lbs/day/acre	0.09	50% (PE)	0.05
H	20000 TPY	0.002 lb/ton (4)	0.08	0.001 lb/ton (4)	0.04
	0.1 ac.	4.70 lbs/day/acre	0.09	50% (PE)	0.05
I	500 TPY	0.014 lb/ton (4)	0.01	0.007 lb/ton (4)	0.01
	0.1 ac.	9.43 lb/day/acre	0.17	50% (PE)	0.09
J	500 TPY	0.014 lb/ton (4)	0.01	0.007 lb/ton (4)	0.01
	0.1 ac.	9.43 lb/day/acre	0.09	50% (PE)	0.09
K	400 TPY	0.014 lb/ton (4)	0.01	0.007 lb/ton (4)	0.01
	0.1 ac.	212.16 lb/day/acre	3.87	50% (PE)	1.94
L	65000 TPY	See Below***	7.79	See Below***	2.60
	1.0 ac.				
M	5000 TPY	0.002 lb/ton*** (4)	0.02	0.001 lb/ton*** (4)	0.01
	0.1 ac.	15.17 lb/day/acre	0.28	50% (PE)	0.14
N	43800 TPY	0.014 lb/ton*** (3)	0.92	0.007 lb/ton*** (3)	0.46
	0.5 ac.	7.07 lb/day/acre	0.65	50% (PE)	0.33
<b>Total Emissions</b>		<b>Tons/Year PE</b>	<b>19.32</b>	<b>Tons/Year PM<sub>10</sub></b>	<b>7.45</b>

\*\*# times" represents the total number of times the material is loaded or unloaded.

\*\*Total throughput for A&B, combined, was used to determine emissions.

\*\*\*Control efficiency applied.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95).

$$E = k (0.0032) [(U/5)^{1.3} / (M/2)^{1.4}] = \text{lb PE/ton processed}$$

Where:

E = emission factor (lb/ton)

k = particle size multiplier (PE=0.74; PM10=0.35)

U = mean wind speed = 9.5 mph

M = moisture content (%)

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88)

$$1.7(s/1.5) [(365-p)/235] (f/15) = \text{lbs PE/day/acre}$$

Where:

s = silt content (%)

p = days with precipitation >0.01" (120)

f = % wind velocity exceeds 12 mph (30%)

**(A) Limestone P112**

**Control:** High moisture content; water as needed.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). BAT is maintenance of high moisture content; water as needed. M=3.5%

$$(0.74)(0.0032) [(9.5/5)^{1.3} / (3.5/2)^{1.4}] = 0.002 \text{ lb PE/ton}$$

$$(0.35)(0.0032) [(9.5/5)^{1.3} / (3.5/2)^{1.4}] = 0.001 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). S=2%

$$1.7(2/1.5) [(365-120)/235] (30/15) = 4.70 \text{ lbs PE/day/acre}$$

**(B) Limestone P115**

**Control:** High moisture content; water as needed.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). BAT is maintenance of high moisture content; water as needed. M=3.5%

$$(0.74)(0.0032) [(9.5/5)^{1.3} / (3.5/2)^{1.4}] = 0.002 \text{ lb PE/ton}$$

$$(0.35)(0.0032) [(9.5/5)^{1.3} / (3.5/2)^{1.4}] = 0.001 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). S=2%

$$1.7(2/1.5) [(365-120)/235] (30/15) = 4.70 \text{ lbs PE/day/acre}$$

$$(0.86 \text{ ton PE/yr}) (0.5 \text{ PM}_{10}/\text{PE}) = 0.43 \text{ ton PM}_{10}/\text{yr}$$

**(C) Coal**

**Control:** Company proposed no control.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). Company proposed no control. M=6.5%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(6.5/2)^{1.4}] = 0.001 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(6.5/2)^{1.4}] = 0.0005 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). Company proposed no control. s=1%

$$1.7(1/1.5) [(365-120)/235] (30/15) = 2.36 \text{ lbs PE/day/acre}$$

**(D) Coke**

**Control:** Company proposed no control.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). M=6.5%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(6.5/2)^{1.4}] = 0.001 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(6.5/2)^{1.4}] = 0.0005 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). s=1%

$$1.7(1/1.5) [(365-120)/235] (30/15) = 2.36 \text{ lbs PE/day/acre}$$

**(E) North Cooling Tower Lime Dust Drop Pile (hopper N of kilns)**

**Control:** High moisture content from cooling tower/sludge-like = 90%.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). M=1%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.014 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.007 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). s=4%

$$1.7(4/1.5) [(365-120)/235] (30/15) = 9.43 \text{ lbs PE/day/acre}$$

**(F) South Cooling Tower Lime Dust Drop Pile (hopper S of kilns)**

**Control:** High moisture content from cooling tower/sludge-like = 90%.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). M=1%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] (1-0.9) = 0.0014 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] (1-0.9) = 0.0007 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88).  $s=4\%$

$$1.7(4/1.5) [(365-120)/235] (30/15) (1-0.9) = 0.943 \text{ lbs PE/day/acre}$$

**(G) Small Limestone Pile #1 (North)**

**Control:** High moisture content; water as needed.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). BAT is maintenance of high moisture content; water as needed.  $M=3.5\%$

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(3.5/2)^{1.4}] = 0.002 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(3.5/2)^{1.4}] = 0.001 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88).  $S=2\%$

$$1.7(2/1.5) [(365-120)/235] (30/15) = 4.70 \text{ lbs PE/day/acre}$$

**(H) Small Limestone Pile #2 (South)**

**Control:** High moisture content; water as needed.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). BAT is maintenance of high moisture content; water as needed.  $M=4\%$

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(3.5/2)^{1.4}] = 0.002 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(3.5/2)^{1.4}] = 0.001 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88).  $S=2\%$

$$1.7(2/1.5) [(365-120)/235] (30/15) = 4.70 \text{ lbs PE/day/acre}$$

**(I) North Kiln Lime Cleanout Chute Pile**

**Control:** Company proposed no control.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95).  $M=1\%$

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.014 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.007 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88).  $s=4\%$

$$1.7(4/1.5) [(365-120)/235] (30/15) = 9.43 \text{ lbs PE/day/acre}$$

**(J) South Kiln Lime Cleanout Chute Pile**

**Control:** Company proposed no control.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). M=1%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.014 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.007 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). s=4%

$$1.7(4/1.5) [(365-120)/235] (30/15) = 9.43 \text{ lbs PE/day/acre}$$

**(K) Temporary LKD Pile (South of Pug Mill)**

**Control:** Company proposed no control.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). M=1%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.014 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.007 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). s=90%

$$1.7(90/1.5) [(365-120)/235] (30/15) = 212.16 \text{ lbs PE/day/acre}$$

**(L) Active LKD pile:** Emissions estimated based on 3/20/98 Draft U.S. EPA Technical Background Document of Fugitive Dust at Cement Manufacturing Facilities.

**Materials in Pile:**

- Unpugged lime fines (Piles E&F; I&J; deposited Pile L)
- Pugged LKD (Pile L)
- Unpugged LKD (Pile K; deposited Pile L)
- Limestone fines (Pile L: daily cover/stabilization)

**Pile Activities:**

- Pile loading (Piles E, F, I, J, & K are estimated elsewhere)
- Bulldozing
- Rolling/Compacting
- Wind erosion

**BACT:**

- Daily soil/limestone cover for active LKD pile
- Pugged LKD
- Immediately cover/water unpugged materials
- Limestone/soil cover of inactive LKD pile

Material	Silt Content	Moisture Content	Control Method	Control Efficiency at Pile Placement	TPY Processed
Unpugged Lime Fines	4%	1%	None	NA	21,000
Pugged LKD	9.9%*	3%	Pug Mill	89%	65,000
Unpugged LKD	90%	1%	None	NA	400
Limestone cover	2%	3.5%	None	NA	1,250

\*Moisture/Silt Contents: (Draft Document 3.3.8)

Control Efficiency of pugged LKD:

$$CE = 100[1 - (Mu^2 / Mc^2)]$$

Where:

CE = control efficiency

Mu = moisture content of dry LKD = 1%

Mc = moisture content of wet LKD = 3%

$$CE = 100[1 - (1.0^2 / 3.0^2)] = 89\%$$

Moisture Content and Corresponding Silt Content:

$$(90\% \text{ silt content}) (1 - 0.89 \text{ CE}) = 9.9\% \text{ silt content}$$

**Pile loading/unloading:** AP-42 Section 13.2.4 (1/95)

Pugged LKD: M=3%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(3/2)^{1.4}] = 0.003 \text{ lb PE/ton}$$

$$(65,000 \text{ tons/yr}) (0.003 \text{ lb PE/ton}) (\text{ton}/2000 \text{ lbs}) = 0.10 \text{ ton PE/yr}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(3/2)^{1.4}] = 0.0015 \text{ lb PM}_{10}/\text{ton}$$

$$(65,000 \text{ tons/yr}) (0.0015 \text{ lb PM}_{10}/\text{ton}) (\text{ton}/2000 \text{ lbs}) = 0.05 \text{ ton PM}_{10}/\text{yr}$$

Limestone Fines: M=3.5%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(3.5/2)^{1.4}] = 0.002 \text{ lb PE/ton}$$

$$(1,250 \text{ tons/yr}) (0.002 \text{ lb PE/ton}) (\text{ton}/2000 \text{ lbs}) (2) = 0.003 \text{ ton PE/yr}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(3.5/2)^{1.4}] = 0.001 \text{ lb PM}_{10}/\text{ton}$$

$$(1,250 \text{ tons/yr}) (0.001 \text{ lb PM}_{10}/\text{ton}) (\text{ton}/2000 \text{ lbs}) (2) = 0.001 \text{ ton PM}_{10}/\text{yr}$$

Total Emissions: 0.103 ton PE/yr & 0.051 ton PM<sub>10</sub>/yr

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88)

Emissions based on daily cover of course limestone fines. S=2%

$$1.7(2/1.5) [(365-120)/235] (30/15) = 4.71 \text{ lbs PE/day/acre}$$

$$(1 \text{ acre}) (4.71 \text{ lbs PE/day/acre}) (365 \text{ days/yr}) (\text{ton}/2000 \text{ lbs}) = 0.86 \text{ ton PE/yr}$$

$$(0.86 \text{ ton PE/yr}) (0.5 \text{ PM}_{10}/\text{PE}) = 0.43 \text{ ton PM}_{10}/\text{yr}$$

**Material Handling Activities:**

**Bulldozing:** AP-42 Section 11.9 (10/98)

Assume all material has been conditioned prior to dozing. Dozing is infrequent and not done wet. Company indicates 180 dozer hours/year. Watering is infrequent/negligible.

$$\text{PE} = 5.7 [(s^{1.2})/(M^{1.3})] = \text{lb PE/dozer hour}$$

$$\text{PM}_{10} = 0.75 [(s^{1.5})/(M^{1.4})] = \text{lb PM}_{10}/\text{dozer hour}$$

Where:

$$s = \% \text{ silt content (9.9\%)}$$

$$M = \% \text{ moisture content (1\%)}$$

$$5.7 [(9.9^{1.2})/(1^{1.3})] = 89.26 \text{ lbs PE/dozer hour}$$

$$(89.26 \text{ lbs PE/hr}) (180 \text{ hours/yr}) (1 \text{ ton}/2000 \text{ lbs}) = 8.03 \text{ tons PE/yr}$$

$$0.75 [(9.9^{1.5})/(1^{1.4})] = 23.36 \text{ lbs PM}_{10}/\text{dozer hour}$$

$$(23.36 \text{ lbs PM}_{10}/\text{hr}) (180 \text{ hrs/yr}) (1 \text{ ton}/2000 \text{ lbs}) = 2.10 \text{ tons PM}_{10}/\text{yr}$$

**Pile Rolling/Compacting:** AP-42 Section 13.2.4 (11/06)

Assume all material has been conditioned prior to rolling/compacting (9.9% silt). Assume worstcase scenario that pile is compacted without a daily cover of soil/limestone.

$$E = k[(s/12)^a (W/3)^b]$$

Where:

$$E = \text{Emission factor (lb PE/VMT)}$$

$$k = \text{particle size multiplier (PE} = 4.9; \text{PM}_{10} = 1.5)$$

$$s = \% \text{ silt content (9.9\%)}$$

$$a = \text{PE: } 0.7; \text{PM}_{10}: 0.9$$

$$b = 0.45$$

$$W = \text{mean vehicle weight (40 tons)}$$

$$\text{PE} = 4.9 [(9.9/12)^{0.7} (40/3)^{0.45}] = 13.68 \text{ lbs PE/VMT}$$

$$(13.68 \text{ lbs PE/VMT}) (12 \text{ VMT/yr}) (1 \text{ ton}/2000 \text{ lbs}) = 0.80 \text{ ton PE/yr}$$

$$\text{PM}_{10} = 1.5 [(9.9/12)^{0.9} (40/3)^{0.45}] = 4.04 \text{ lbs PM}_{10}/\text{VMT}$$

$$(4.04 \text{ lbs PM}_{10}/\text{VMT}) (12 \text{ VMT/yr}) (1 \text{ ton}/2000 \text{ lbs}) = 0.02 \text{ ton PM}_{10}/\text{yr}$$

**Total Material Handling Emissions:** 8.83 tons PE/yr; 2.12 tons PM<sub>10</sub>/yr

**Total Storage Pile Emissions:** 7.79 tons PE/yr; 2.60 tons PM<sub>10</sub>/yr

**(M) Housekeeping Dust Pile**

**Control:** Material goes through pug mill. Silt and moisture contents reflect an 89% control. Assumes there is no loss of unpugged material during loading. Company employs an enclosure capable of achieving 35% control.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). M=3%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(3/2)^{1.4}] (1-0.35) = 0.002 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(3/2)^{1.4}] (1-0.35) = 0.001 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). s=9.9%

$$1.7(9.9/1.5) [(365-120)/235] (30/15) (1-0.35) = 15.17 \text{ lbs PE/day/acre}$$

**(N) Sawdust Pile**

**Control:** Company proposed no control.

**Pile Loading/Unloading:** AP-42 Section 13.2.4 (1/95). M=1%

$$(0.74)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.014 \text{ lb PE/ton}$$

$$(0.35)(0.0032)[(9.5/5)^{1.3}/(1/2)^{1.4}] = 0.007 \text{ lb PM}_{10}/\text{ton}$$

**Wind Erosion:** USEPA's Control of Open Fugitive Dust Sources (9/88). s=3%

$$1.7(3/1.5) [(365-120)/235] (30/15) = 7.07 \text{ lbs PE/day/acre}$$

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**APPLICABLE REGULATIONS/EMISSION LIMITATIONS:**

**OAC 3745-31-05(A):**

**F002:** 19.32 tons PE/year; 7.45 tons PM<sub>10</sub>/year

Load-in and Load-out:

- a. No visible PE except for one minute during any 60-min period.
- b. Best available control measures that are sufficient to minimize or eliminate visible emissions of fugitive dust.

Wind Erosion:

- a. No visible PE except for one minute during any 60-min period.
- b. Best available control measures that are sufficient to minimize or eliminate visible emissions of fugitive dust.

LKD Material Handling Operations:

- a. Visible PE shall not exceed 20% opacity, as a 6-minute average.
- b. Best available control measures that are sufficient to minimize or eliminate visible emissions of fugitive dust.

**OAC 3745-17-08(A):** Carmeuse Lime is not located within an "Appendix A" area as identified in OAC rule 3745-17-08. Therefore, pursuant to OAC rule 3745-07-08(A), this emission unit is exempt from the requirements of OAC rule 3745-17-08(B)(1).

**OAC 3745-17-07(B):** This emissions unit is exempt from the visible PE limits specified in OAC rule 3745-17-07 (B) pursuant to OAC rule 3745-17-07(B)(11)(e).

**40 CFR Part 52.21, OAC rule 3745-31-10 through 20 - BACT**

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Completed by: Andrea Odendahl Date: revised 2/2010