Ohio Environmental Protection Agency
Division of Air Pollution Control

Response to Comments
Lead Attainment Demonstration for the 2008 Lead Standard
for the Cuyahoga County Partial Nonattainment Area

Agency Contact for this Package

Division Contact: (Jennifer Dines, Division of Air Pollution Control, 614-644-2310, Jennifer.dines@epa.state.oh.us)

Ohio EPA held a public hearing in Parma, OH on June 14, 2012, regarding the attainment demonstration for the Cuyahoga County partial nonattainment area for lead. This document summarizes the comments and questions received at the public hearing and during the associated comment period, which ended on June 14, 2012. Ohio EPA reviewed and considered all comments received during the public comment period.

By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health.

In an effort to help you review this document, the questions are grouped by topic and organized in a consistent format. The name of the commenter follows the comment in parentheses.

General Comments/Overall Concerns

Comment 1: **Page 3 of the dispersion modeling document states that a background concentration was not needed as part of the analyses. While it's clear the culpable source of the peak monitored values is Bunting Bearings, it's not clear that background concentrations of lead in the area are zero. A background value must be included or additional information should be added verifying that the background value is negligible. A wind direction analysis using the existing monitor could provide information to help determine a representative background level of lead (U.S. EPA).**

The Attainment Demonstration Section of the SIP document notes that only weekday monitoring was used in the analysis because Bunting operations shut down from Friday evening until Midnight on Sunday. Weekend monitoring may be

useful in determining background values or to determine the impact from the roadway fugitive emissions (U.S. EPA).

Response 1: Although Ohio EPA does not believe it is necessary to add a background due to the extremely conservative nature of the modeling that was conducted, we have performed an equally conservative analysis of background and it is now included in the modeling results for the demonstration of future attainment.

Comment 2: **Page 3 of the dispersion modeling report states that a 1 lb/hr emission rate was used for modeling the roadway through the facility. It's unclear how this emission rate was arrived at and how it was applied. It's very high relative to the stack source emissions (U.S. EPA).**

Response 2: The 1 lb/hr emission rate was part of the *Base Case* analysis, which, according to Page 3 of Appendix E1: Dispersion Modeling Demonstration for Fulton County, was "a reasonable attempt to replicate actual conditions", that is, replicate the actual conditions under which the violation occurred. In this scenario, actual emission rates based on the best available information at the time were used for each of the 22 emission units at the Bunting Bearings, LLC facility. These emission rates are shown in Table 1 of Appendix E1: Dispersion Modeling Demonstration for Fulton County. In addition to the 22 units with known emissions, Ohio EPA modeled an area along the central roadway in Bunting where the air monitor is located, the baghouses are located and movement of baghouse collections bags that have been changed occurs. During a site visit, Ohio EPA employees determined poor maintenance and housekeeping issues associated with the baghouses and collection bag changing procedures were resulting in high monitor readings. Due to the potential emissions from this fugitive source, Ohio EPA included this source in the base case modeling so that an accurate representation of the emissions could be characterized to determine the source of the violation. The emission rate of 1 lb/hr was used to model the fugitive emissions of the roadway to most efficiently take advantage of the linear nature of AERMOD in calculating the best possible estimate of the actual roadway emissions contributing to the violation. A sample calculation using the 1 lb/hr emission rate and the scaling of this value to match the monitored violation is provided in response to comment 3, below.

Comment 3: **It's not clear to me how the normalized values were obtained in Table 4 of the dispersion document and ultimately how the**

information was used, except for identifying culpable units (U.S. EPA).

Response 3: Identifying culpable units was the utility and, indeed, the purpose of the base case analysis. That is, the base case analysis demonstrates that at typical operating conditions, fugitive emissions along the roadway occurring from poor maintenance practices are the cause of monitored violations. From Appendix E: Dispersion Modeling Analysis for Fulton County, Ohio Lead NAAQS Partial Nonattainment Area submitted with Ohio's 2008 Revised Lead Standard State Implementation Plan for Fulton County Partial Nonattainment Area, "The purpose of modeling actual conditions was to determine the cause of the violation and the contribution to the modeled violation by each source". The normalization process, based on the linear nature of AERMOD and the actual monitored violation, yields a real emission rate for the fugitive source that can be compared one-to-one with the known emission rates of the permitted sources. As mentioned above, Ohio EPA applied an emissions rate of 1.0 lb/hr to the fugitive source roadway with an actual unknown emissions rate, and then back-calculated a realistic, actual fugitive emission rate. Because AERMOD is a linear model, it allows model result to be ratioed, or scaled to determine the actual emission from the fugitive source that would correspond to the actual monitored average. Due to the unknown emission rate of the poorly maintained roadway, these results had to be scaled so the total modeled concentration matches the monitored value. Sample calculations for this process can be shown in several steps, and Table 4 from Appendix E is replicated here for convenience:

Emissions Unit	Description of Source Emissions	Maximum Modeled Contrbution ($\mu g/m^3$)	Monitor Normalized Contribution ($\mu g/m^3$)	Percent Contribution ($\mu g/m^3$)
P014 through P019, P028	Induction Furnaces #1-7	0.00159333	0.001593	0.895%
P020 through P025, P029	Tundish's #1-7	0.000026667	0.000027	0.015%
P005	Ball Crusher	0.000020	0.000020	0.011%
P006 and P007	Centrifugal Furnaces #1 and 2			
P008 through P011	Centrigugal Machines #1-4			
P013	Centrifugal Transport Ladle			
Roadway	Fugitive Emissions	53.1310	0.17636	99.079%
Facility Total		**53.1326**	**0.178**	**100.00%**

Table 4: Base Case scaled contribution by source to maximum concentration for Bunting.

STEP 1: Subtraction of known contributions to modeled maximum
The modeled maximum concentration for the base case analysis was 53.1326 $\mu g/m^3$. Using the lead post-processing software, the contribution of the three baghouses and the roadway emissions to this maximum were determined. In this first step, the contribution of the fugitive roadway emissions is calculated by subtracting the contribution of the three baghouses from the facility total:

Facility Total – (Baghouse A + Baghouse B + Baghouse C) = modeled fugitive contribution
53.1326 $\mu g/m^3$ – (0.000026667 $\mu g/m^3$ + 0.00159333 $\mu g/m^3$ + 0.000020 $\mu g/m^3$) = 53.1310 $\mu g/m^3$

In like manner, as the baghouse emission rates are known and will contribute to the monitored concentration as above, the same process can be performed for the monitored values:

Facility Total – (Baghouse A + Baghouse B + Baghouse C) = monitored fugitive contribution
0.178 $\mu g/m^3$ – (0.000026667 $\mu g/m^3$ + 0.00159333 $\mu g/m^3$ + 0.000020 $\mu g/m^3$) = 0.17636 $\mu g/m^3$

STEP 2: Determination of the actual emission rate of roadway
As stated previously, the fugitive emission rate of the roadway was initially assigned a value of 1 lb/hr. Using the ratio of the

calculated contribution of the fugitive source to the monitored violation and the modeled contribution of the fugitive source to the modeled violation, the emission rate of 1 lb/hr can be scaled to reflect what the actual emission rate of the fugitive source was during the time period in which the violation was monitored. This equation is shown below:

$$\frac{\textit{Monitored Fugitive Contribution}}{\textit{Modeled Fugitive Contribution}} \times \textit{Modeled Emission Rate} = \textit{Normalized Rate}$$

Using the both the modeled and monitored values for Bunting Bearings and the above equation, the normalized emission rate of the fugitive roadway source was calculated as:

$$\frac{0.17636\ \mu g/m^3}{53.1310\ \mu g/m^3} \times 1\ \frac{lb}{hr} = 0.003319\ lb/hr$$

Thus, the 1.0 lb/hr provided the simplest method of determining the fugitive emission rate. Were another value other than 1.0 lb/hr modeled for the same time period, leaving all other variables within the model constant, the above equation would hold, and a value of 0.003319 lb/hr would be obtained for the fugitive emission rate.

STEP 3: Determination of source contribution to monitored violation

Lastly, the percent contribution of each source to the monitored violation was determined by dividing the contribution of each source to the monitored concentration by the total concentration monitored during the violation, and converting this value to a percentage by multiply by 100. An example of this calculation is shown below, using the fugitive roadway as the source.

$$\frac{0.17636\ \mu g/m^3}{0.17800\ \mu g/m^3} \times 100\% = 99.079\%$$

Thus, the fugitive emissions from the poorly maintained roadway can be shown to be the primary contributor to the monitored violation.

Comment 4: **The future case attainment modeling does not include fugitive impacts. It seems unlikely that fugitive emissions from the roadway will be zero, even after the maintenance and**

housekeeping measures are applied. Recognizing the uncertainty about fugitive emissions, it was clear they had a significant impact on the monitoring as demonstrated in the base case modeling. If significant, fugitive source impacts must be represented in the attainment demonstration modeling (U.S. EPA).

Response 4: Ohio EPA does not believe fugitive emissions from the roadway will be significant if proper housekeeping and maintenance occurs as outlined in Bunting's Preventative Maintenance Plan. However, in order to maintain a conservative approach to demonstrating attainment, Ohio EPA is refining the modeling to include a very conservative, yet still deminimis, level of fugitive roadway emissions.

Comment 5: **The table on Page 8 of the dispersion modeling document lists the modeled emission rates for the three baghouses. It's unclear how the lb/hr emission rates were derived for use in the modeling. It's also not clear to me whether they represent short-term emissions, quarterly emissions, or annual emissions. EPA's July 8, 2011 Question and Answer Memorandum on Lead Implementation states, on page 6, that limits derived based on modeling should generally use maximum hourly potentials for model input (U.S. EPA).**

Response 5: The emission rates in the table on page 8 are maximum short-term hourly emissions in pounds. They were derived as part of the analysis of RACM and determining what federally enforceable emissions rates would be necessitated in order to demonstrate attainment of the lead standard. These rate will become federally enforceable maximum allowable short-term emissions rates for Bunting.

Comment 6: **It was unclear from the write-ups and figures if receptors were placed along the roadway. EPA's policy on ambient air requires modeling to evaluate public roadways (U.S. EPA).**

Response 6: Receptors were not placed along the roadway. The roadway is within Bunting's property and not a public roadway. The roadway is gated and not to be used by the public as indicated in posted signage. The draft document did indicate that public traffic has passed through there in the past; however, when this occurs this traffic is trespassing on private property.

End of comments