State of Ohio Environmental Protection Agency
Division of Air Pollution Control

Ohio's Lead Attainment Demonstration Analysis for Fulton County Partial Nonattainment Area under the 2008 Lead Standard

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Section One

Background

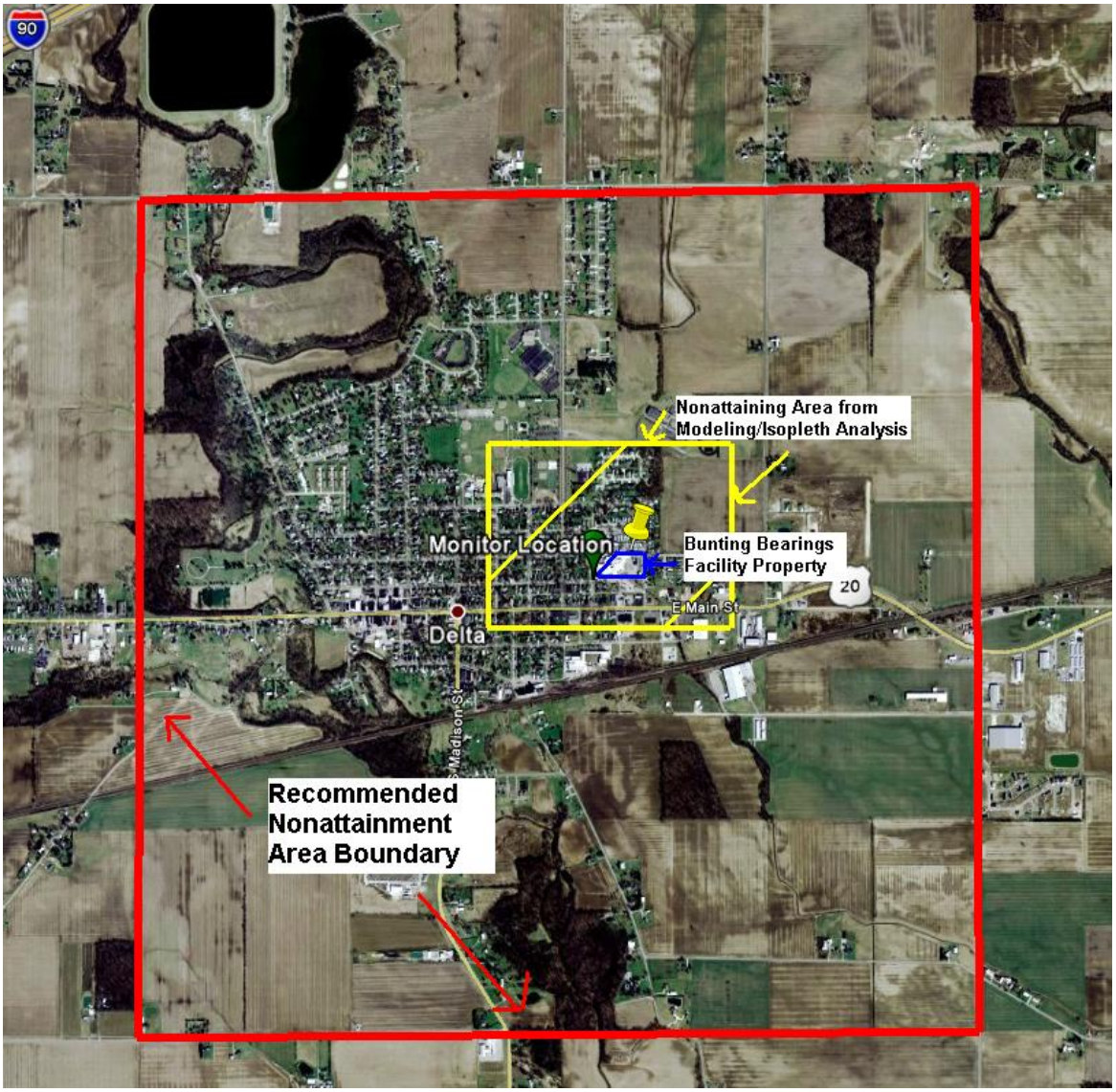
The United States Environmental Protection Agency (U.S. EPA) revised the National Ambient Air Quality Standard (NAAQS) for lead on November 12, 2008 (73 FR 66964) with an effective January 12, 2009. It replaced the existing lead standard of 1.5 ug/m^3 with a lower standard of 0.15 ug/m^3 as a rolling three-month average.

On November 22, 2010 (75 FR 71033), effective December 31, 2010, U.S. EPA promulgated the initial lead nonattainment areas for the revised lead standard across the country. The CAA Amendments requires states with lead nonattainment areas to submit a plan within eighteen months of the effective date of the designations (June 30, 2012) detailing how the lead standard will be attained by December 31, 2015. Ohio EPA submitted its attainment demonstration on June 25, 2012. However, based on 2012 to 2014 air quality data, Ohio attained the standard before the deadline and submitted a clean data request on February 20, 2015. On May 26, 2015 (80 FR 29964) U.S. EPA approved Ohio EPA's clean data request with an effective date of July 27, 2015. As a result of attaining the standard, Ohio EPA withdrew the attainment demonstration on July 27, 2015 as U.S. EPA had not taken any formal action and the need for U.S. EPA to approve Ohio's attainment demonstrations is no longer necessary.

This document details Ohio's Lead State Implementation Plan (SIP) analysis that was submitted on June 25, 2012 for the partial Fulton County nonattainment area in the State of Ohio. This document does not contain the entire SIP analysis submitted to U.S. EPA on June 25, 2012, but rather, only those portions that are relevant to supporting the redesignation request and maintenance plan of which this document is now an appendix.

This partial nonattainment area encompasses emissions from the Bunting Bearings LLC (herein referred to as "Bunting"). Bunting (Ohio EPA facility identification # 0326000015) is located at 200 Van Buren Street, Delta, Ohio, 43515. Figure 1 shows this lead nonattainment area's boundary, the facility location, and the monitoring network within.

Figure 1: Fulton County Partial Lead Nonattainment Area and Monitoring Network: The area enclosed by sections 12 and 13 of York Township and sections 7 and 18 of Swan Creek Township.



Section Two

Monitoring and Ambient Air Quality Data

Ohio EPA maintains a comprehensive network of lead air quality monitors throughout Ohio with the primary objective being to determine compliance with the lead NAAQS. Figure 1 shows Fulton County's partial nonattainment area and the location of the designated lead monitor.

In accordance with the CAA Amendments, three complete years of monitoring data are required to demonstrate attainment at a monitoring site. 40 CFR Part 50, Appendix R provides the computation methods for the lead standard. This regulation requires individual samples be analyzed and a monthly mean computed. Compliance with the lead standard is determined over a three-calendar year period. Any one exceedance of a three-month average during this period indicates an exceedance of the lead standard. When this occurs, the area is said to be in nonattainment.

Table 1 provides a summary of the annual average lead monitoring data for 2006 through 2011 for this area's lead monitoring site. The nonattainment areas' air quality was above the standard consistently in 2006, 2007 and 2008 as can be seen by Table 1. In early 2009 the facility made some housekeeping changes and air quality subsequently began to improve. However, as can be seen in Figure 2, beginning in January 2011, monthly monitor values were observed above the 0.15 ug/m^3 standard resulting in a January to March 2011 3-month rolling average in violation of the standard, 0.178 ug/m^3. Ohio EPA began communicating with Bunting and performed a site visit on August 9, 2011. During this visit, several housekeeping issues were discovered as will be discussed later in this document. The monitoring data was retrieved from the U.S. EPA Air Quality System (AQS) database (Appendix A). The AQS contains ambient air pollution data collected by U.S. EPA, state, local and tribal air pollution control agencies from thousands of monitoring stations. Data from the AQS is used to assess air quality, assist in attainment/nonattainment designations, evaluate state implementation plans for nonattainment areas, perform modeling for permit review analysis, and manage other air quality management functions.

The AQS database is updated monthly by states and local environmental agencies that operate the monitoring stations. States provide the monitoring data to U.S. EPA as required by the CAA Amendments.

Table 1. Three-Month Rolling Average Lead Data (2006 – 2011) in the Fulton County Partial Nonattainment Area.

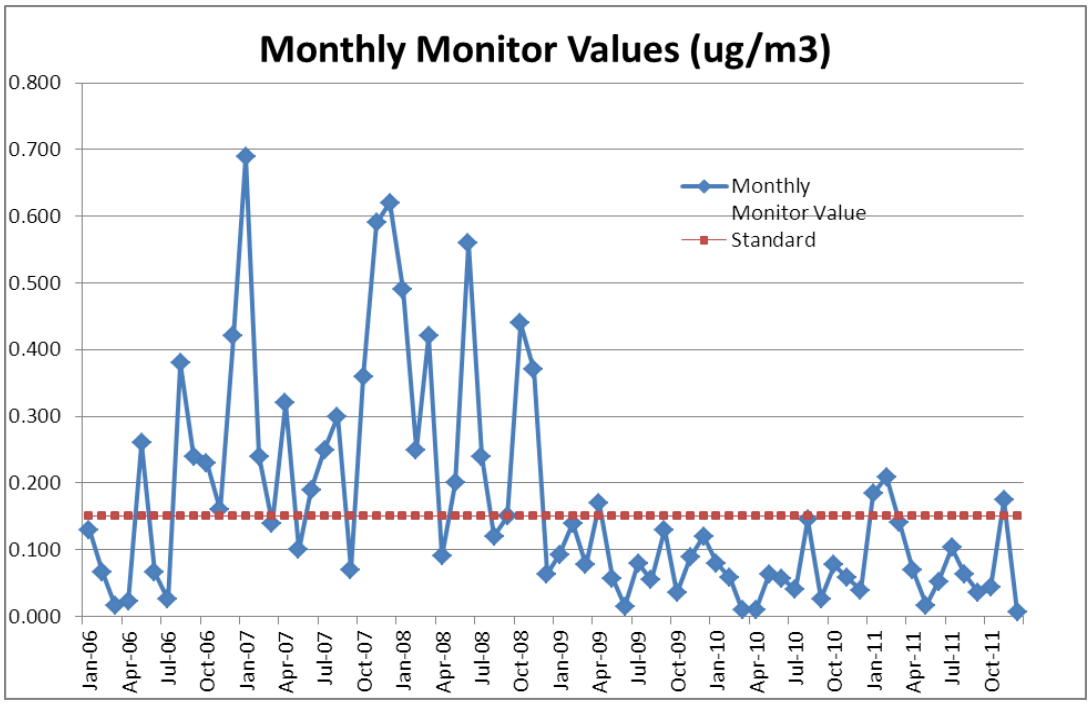
= Exceeds standard

Site Location City	3-month period	Three-month rolling average (ug/m^3)					
		2006	2007	2008	2009	2010	2011
39-051-0001 Bunting Bearings Facility Delta, OH	Nov -Jan	0.105	0.423	0.567	0.176	0.096	0.094
	Dec -Feb	0.090	0.450	0.453	0.099	0.086	0.144
	Jan -Mar	0.071	0.357	0.387	0.103	0.049	0.178
	Feb-Apr	0.035	0.233	0.254	0.129	0.025	0.140
	Mar-May	0.100	0.186	0.237	0.101	0.027	0.076
	Apr-Jun	0.116	0.203	0.267	0.081	0.043	0.046
	May-July	0.117	0.180	0.317	0.051	0.053	0.058
	Jun-Aug	0.157	0.247	0.290	0.050	0.081	0.073
	July-Sept	0.215	0.205	0.170	0.088	0.070	0.067
	Aug-Oct	0.283	0.242	0.237	0.073	0.083	0.048
	Sept-Nov	0.210	0.339	0.320	0.085	0.054	0.085
	Oct-Dec	0.270	0.523	0.291	0.081	0.058	0.075

Sites with one or months of a composite analysis missing in any three-month period.

Data source: U.S. EPA Air Quality System (AQS). http://www.epa.gov/ttn/airs/airsaqs/index.htm

Figure 2. Monthly Monitor Values (2006 – 2011) in the Fulton County Partial Nonattainment Area.



Section Three

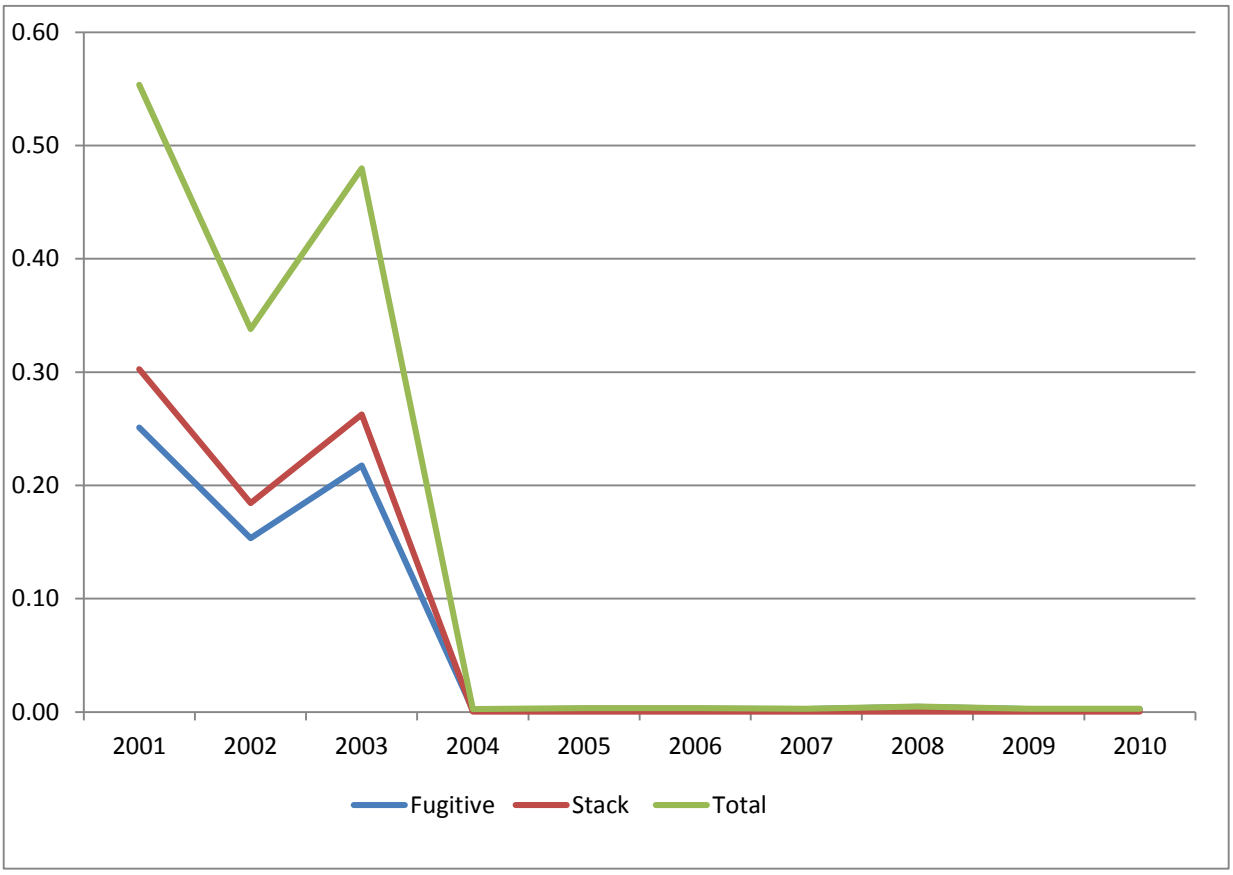
Emissions Analysis

Bunting is below NEI reporting thresholds and only reports lead emission data through the Toxics Release Inventory (TRI). Table 2 summarizes historical lead emissions for Bunting reported under the TRI program. Figure 3 shows the reporting of lead has trended downward since 2001. There are no other sources of lead emissions in the nonattainment area.

Table 2. Bunting TRI Data (2001 – 2010).

	LEAD COMPOUNDS (TPY)		
	Fugitive	**Stack**	**Total**
2001	0.25	0.30	0.55
2002	0.15	0.18	0.34
2003	0.22	0.26	0.48
2004	0.0020	0.00050	0.0025
2005	0.0030	0.00050	0.0035
2006	0.0030	0.00050	0.0035
2007	0.0025	0.00050	0.0030
2008	0.0045	0.00050	0.0050
2009	0.0025	0.00050	0.0030
2010	0.0025	0.00050	0.0030

Figure 3. Bunting TRI Data (2001 – 2010) Trends in Tons Per Year.



Section Four

Reasonably Available Control Measures

Section 172(c)(1) requires plan provisions provide for implementation of Reasonably Available Control Measures (RACM) as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of Reasonably Available Control Technology (RACT)) and provide for attainment of the national primary ambient air quality standards. In March 2012, U.S. EPA issued guidance entitled "Implementation of the 2008 Lead National Ambient Air Quality Standards: Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions" (herein referred to as "RACM Guidance"). The RACM Guidance states that "most sources that will be required to implement RACM will be in the source categories focused on by this document – Secondary Lead Smelting, Lead Acid Battery Manufacturing, Iron and Steel Foundries, and Iron and Steel Mills. However, there might be some sources in other source categories that will be required to implement RACM for controlling lead emissions." The

RACM Guidance provides basics steps that States can use in determining what constitutes RACM. Ohio EPA has performed a RACM analysis (Appendix B) for Bunting and has determined that existing controls and practices constitutes RACM, and that those existing controls and practices along with additional housekeeping and preventative maintenance practices being implemented by Bunting to address the 2011 exceedances will ensure attainment of the standard. These measures are discussed in greater detail under the Control Measures, Means or Techniques heading of the Attainment Demonstration Strategy Analysis portion of this section.[1]

Attainment Demonstration Strategy Analysis

Background

Bunting manufactures continuous cast and centrifugal cast products in copper based alloys (typically bronze) which contain various percentages of lead. The lead component is integral in most of Bunting's products in that it adds machineability to the characteristics of bronze. A typical process flow would include the melting of the metal, the addition of alloys in the appropriate percentages, the pouring and casting of the material into various shapes, and after cooling, the machining of the material into the desired product.

As seen under Table 1 and Figure 2 above, monitored values remained consistently high until early 2009 when housekeeping changes were made. In 2011, three-month rolling averages began to increase slightly again with an exceedance of the 3-month average occurring in the January to March 2011 period. In 2011, Ohio EPA began working with Bunting staff to determine the cause of the exceedance of the standard.

Ohio EPA performed a site visit on August 9, 2011. Bunting has three baghouse locations (A, B and C) with a roadway in between. The monitor location is also along this roadway (Figure 4). During this visit, several housekeeping issues were discovered. Baghouse dust was visible on the exterior of the baghouse components, collection bags and on the ground around the collection bags. Improperly connected collection bags were also noted. Bunting also reported that earlier in the year a leak around the auger on baghouse B was identified. This was allowing dust that was collected in the baghouse to spill out on the ground instead of discharging into the collection bag. They were unsure of how long the leak occurred. And lastly, it is believed that Bunting's procedure for collection bag replacement and storage may also be a source of fugitive lead emission. Collection bags are removed and loaded on a forklift which transports the bag along the roadway crossing by the air monitor identified in Figure 4 and Figure 5 and into Plant #2 via the parking area on the east end for final storage. The bags are not contained and dust could be generated from those bags during this process. Appendix C contains a Bunting September 27, 2011 memo identifying potential issues that could have caused an exceedance and procedures to be implemented in the future.

1 The RACM Guidance erroneously identified Northstar Bluescope Steel as necessitating a RACM analysis. However, this source is not located in the nonattainment area. This error been communicated to U.S. EPA.

Figure 4. Bunting Site Map.

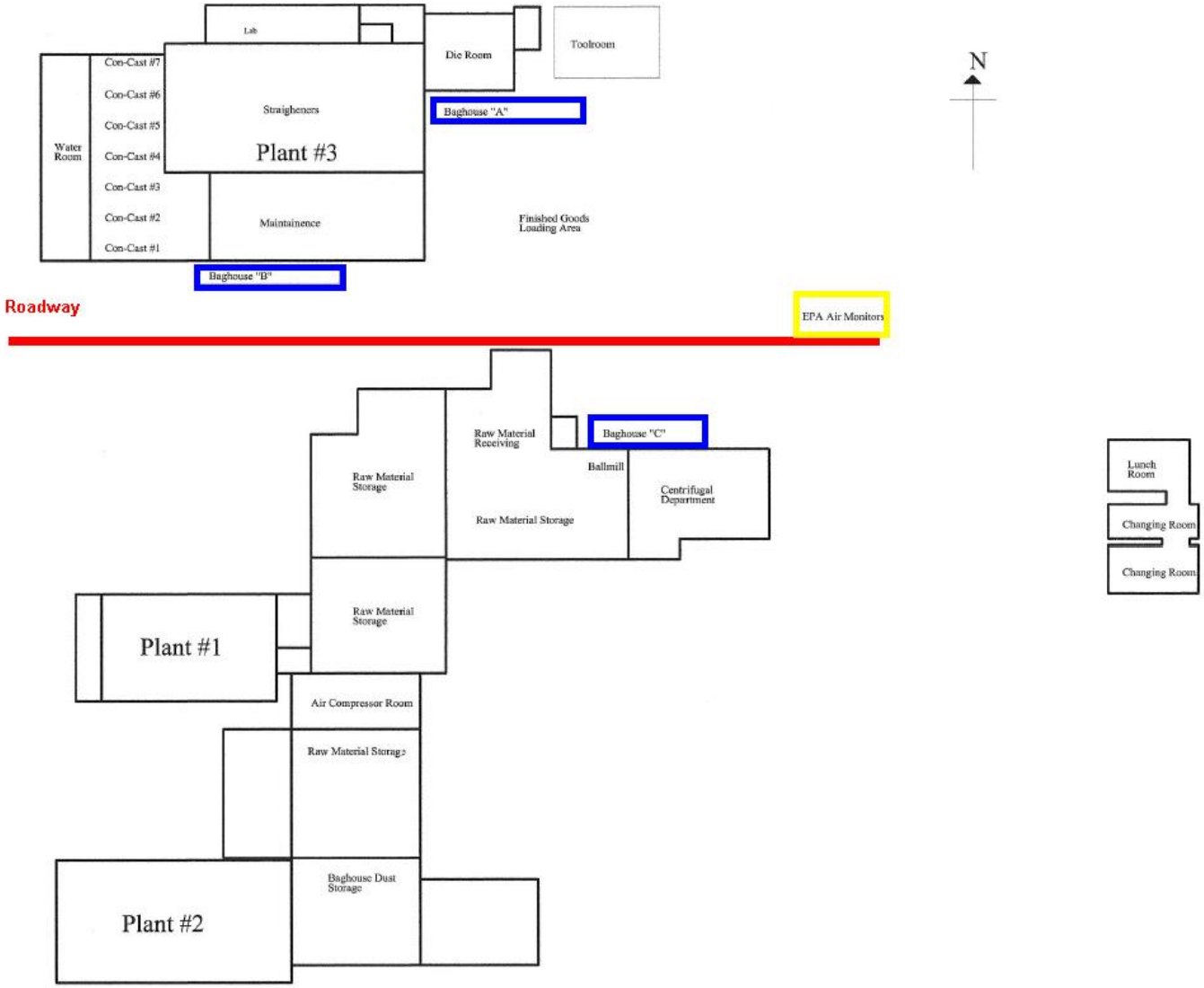
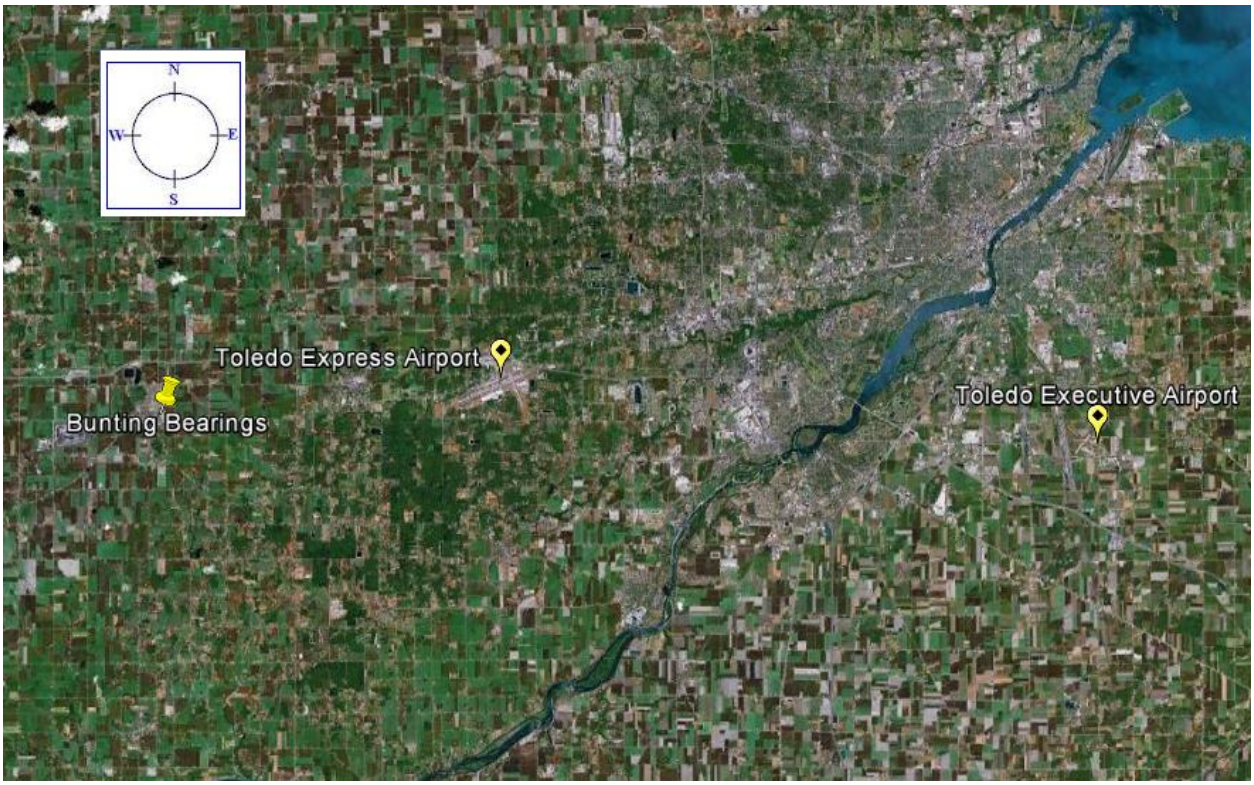


Figure 5. Bunting Aerial Site Map.

As can be seen from Figure 4 and 5 above, a westerly, west-south-west or west-north-west wind would most likely lead to violations of the lead standard when maintenance or housekeeping issues occur at the baghouses. Two meteorological stations were used to analyze monitoring data trends: Toledo Express Airport located east of Bunting and Toledo Executive Airport located even further to the east (Figure 6).

Figure 6. Meteorological Station Locations.



Daily monitor values for 2011 were plotted against daily wind direction counts for both meteorological stations as depicted in Figures 7 and 8 below.

Figure 7. Toledo Express Airport Daily Wind Counts vs. the Standard.

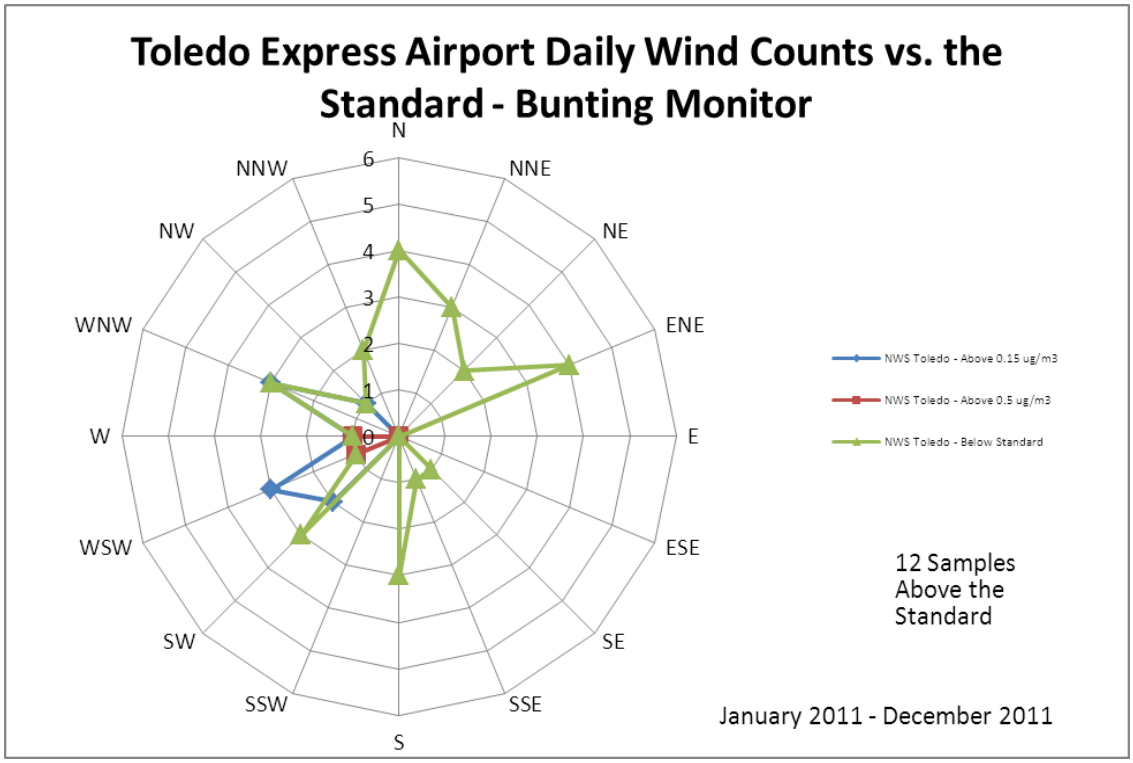
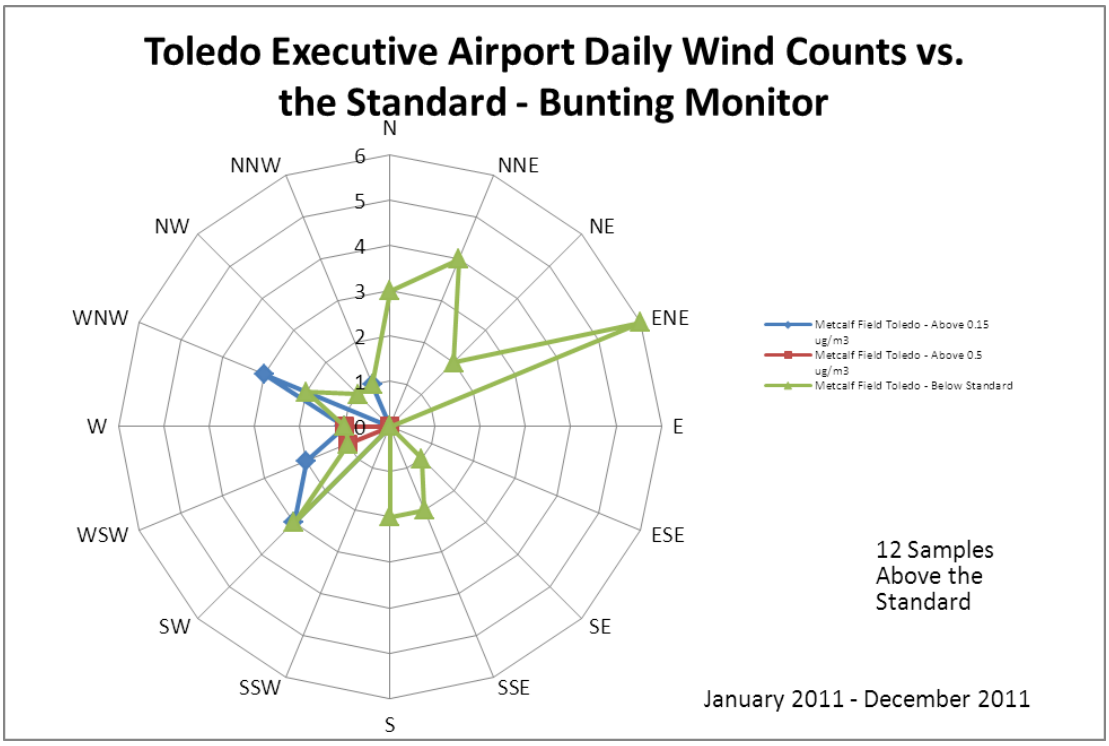


Figure 8. Toledo Executive Airport Daily Wind Counts vs. the Standard.



As depicted in Figures 7 and 8 above, higher monitored days are predominantly associated with winds coming out of the west, west-south-west or west-north-west where winds pass by the baghouse and roadway area before reaching the monitor. Note that only weekday monitoring was used as part of this analysis. Bunting operations, including baghouses, are shutdown on Friday evenings and baghouses are restarted at midnight on Sundays to allow startup of operations to resume on Mondays.

As can be seen from Table 3 below, for all days where the monitor recorded over 0.15 ug/m^3 in 2011 (12), wind directions were predominantly from the westerly directions, weather conditions were predominantly clear or overcast, and production was occurring. In addition, in 50% of those days, collection bags on baghouses were changed within no more than 2 days of monitoring.

Table 3. Bunting 2011: Comparison of Daily Monitor Values over 0.15 ug/m^3, Wind Direction, Weather Conditions, Baghouse Collection Bag Changes and Production.

Date (2011)	Total BH Dust Collected (pounds)	Monitor (ug/m3)	Predominant Wind Direction	Predominant Weather Conditions	Production (pounds)
1/20	1160		W	SNOW	54251
1/21		0.539	W	OVERCAST	28918
1/27		0.324	SW	SNOW	37437
2/8		0.385	W	OVERCAST	41449
2/14		0.370	W	OVERCAST	30361
3/8	3266				7583
3/10		0.378	WNW	OVERCAST	32631
3/15	1188				33823
3/16		0.274	WSW	OVERCAST	28907
4/21		0.188	W	CLEAR	22708
6/7	1600				36023
6/8		0.161	SW	CLEAR	35322
7/26		0.300	WSW	CLEAR	32569
8/1	1346	0.268	W	CLEAR	21828
11/11		0.530	W	OVERCAST	29394
11/16	5734				19340
11/17		0.232	SW	CLEAR	29977

As can be seen in Appendix C, Bunting began clean up procedures and implementing improved bag change procedures in October 2011. Two daily exceedances occurred in November as Bunting was in the early stages of implementing the new procedures. However, since that time, January 2012 data[2] has also been below the standard

[2] Only January data is available at this time due to the time necessary to analyze filters. 2012 data is not quality assured at this time.

ranging from 0.0154 to 0.115 ug/m^3. Additional discussion about Bunting's strategy to maintain compliance with the lead standard can be found in the Control Measures, Means or Techniques section below.

Modeling

Per U.S. EPA's guidance (2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Questions and Answers, July 8, 2011 (herein referred to as "Q&A Guidance"), "modeling for attainment demonstrations is used to show that a nonattainment area will be in attainment by the attainment date. The modeling is used to show the effectiveness of control measures on the sources. For attainment modeling, maximum allowable or federally enforceable permit limits should be the basis of the model input emissions, as described in Section 8.1 and Table 8-1 of Appendix W and the Guideline for Air Quality Models."

Two dispersion modeling analyses were performed for this analysis. One was an analysis relevant to the 2011 period, prior to implementing better maintenance and housekeeping procedures (base case). Ohio EPA's analysis demonstrates the level of lead emissions that had to have occurred during a representative period when the facility was not being maintained properly. The second analysis demonstrates when the equipment is functioning properly and maintained properly, Bunting's federally enforceable permit limits provide for attainment of the standard (future case).

The base case analysis evaluated a reasonable estimate of maximum actual emissions to determine the contribution of fugitive emissions from poor maintenance and housekeeping at Bunting that contribute to the highest monitored concentrations. For this analysis, Ohio EPA selected the 3-month period of January to March 2011, when the highest three-month rolling average of 0.178 ug/m^3 occurred. Bunting has acceptable federally enforceable permit limits to ensure compliance with the lead standard. As part of the base case analysis, Ohio EPA used stack test data for particulate emissions to determine a reasonable lead emissions rate to apply to each unit with potential lead emissions.

The future case analysis evaluated the existing controls, the federally enforceable permit limits, and the absence of fugitive emissions resulting from poor housekeeping and maintenance. Bunting has developed a Preventative Maintenance Plan (approved revised version is located in Appendix C to the Redesignation Request and Maintenance Plan for the Partial Fulton County, OH Annual Lead Nonattainment Area) intended to ensure the potential for fugitive emissions of lead around the baghouses will be minimized to deminimus levels, if not eliminated, in the future. Dispersion modeling was used to validate that the control strategies and permit limits will provide for attainment of the standard.

This dispersion modeling analysis was performed using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) modeling system.

Appendix D contains the full modeling analyses and documentation.

Enforceable Emission Limitations

Bunting was issued a federally enforceable permit-to-install and operate (FEPTIO) on October 29, 2012 (Ohio EPA permit # P0108083). Table 4 identifies lead sources (emissions units), corresponding control devices and federal enforceable permit limits that were incorporated into their FEPTIO for lead.

Control Measures, Means or Techniques

All lead processes at Bunting are currently controlled by three baghouses. Because of maintenance and housekeeping issues, Bunting has made several changes (as discussed above and in their September 27, 2011 memo). In addition, Bunting implemented a comprehensive Preventative Maintenance Plan (approved revised version is located in Appendix C to the Redesignation Request and Maintenance Plan for the Partial Fulton County, OH Annual Lead Nonattainment Area) to ensure proper housekeeping and adequate operation of all baghouses.

Ohio EPA also performed a RACM analysis (Appendix B) for Bunting and has determined that existing controls and practices, along with those practices being implemented by Bunting to address the 2011 exceedances as part of their Preventative Maintenance Plan, and the new FEPTIO emissions limits constitutes RACM.

Table 4. Bunting Sources of Lead, Control Devices, and Federally Enforceable Permit Limits.

Emission Unit	Description of Source Emissions	Control Device	Permit Limit (pound/hour)
P014 through P019, P028	Induction Furnaces #1-7	Baghouse B	1.50 particulate emissions, 0.150 lead combined limit
P020 through P025, P029	Tundish's #1-7	Baghouse A	1.50 particulate emissions, 0.150 lead combined limit
P005	Ball Crusher	Baghouse C	0.750 particulate emissions, 0.0750 lead combined limit
P006 and P007	Centrifugal Furnaces #1 and 2		
P008 through P011	Centrifugal Machines #1-4		

P013	Centrifugal Transport Ladle		

In accordance with U.S. EPA's Q&A Guidance, Bunting was issued a federally enforceable permit-to-install and operate (FEPTIO) with the above emissions limitations and requirement for the Preventative Maintenance Plan by November 1, 2012. U.S. EPA's Q&A Guidance states:

> *Control measures for the 2008 NAAQS need to be in place as expeditiously as practicable. In order for control measures to result in three years of monitored clean data by the attainment date, areas designated in the first round of designations (effective December 31, 2010, and requiring attainment demonstrations that show that the area will attain the standard as expeditiously as practicable, but no later than December 31, 2015) would need to have all necessary controls in place no later than November 1, 2012…..*