

MISSOURI
EPA's Intended Area Designations for the
2008 Lead National Ambient Air Quality Standards

Introduction

EPA has revised the level of the primary (health-based) standard from 1.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to $0.15 \mu\text{g}/\text{m}^3$ measured as total suspended particles (TSP). EPA has revised the secondary (welfare-based) standard to be identical in all respects to the primary standard.

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as “nonattainment” those areas that violate the NAAQS and those nearby areas that contribute to violations. The table below identifies the counties or portions of counties in Missouri that EPA intends to designate “nonattainment” for the 2008 lead national ambient air quality standard (2008 Lead NAAQS).

Table 1. Missouri Lead NAAQS Nonattainment Areas

Area	Missouri Recommended Nonattainment Counties	EPA's Intended Designated Nonattainment Counties	Nonattainment area for 1978 Lead NAAQS
Jefferson County	Jefferson County (partial)	Jefferson County (partial)	City Limits of Herculaneum
Iron County	Iron, Dent, and Reynolds (partial)	Iron, Dent, and Reynolds (partial)	None*

* Portions of western Iron County identified as Maintenance Areas

Within one year of a new NAAQS rulemaking, Section 107(d)(1) of the Clean Air Act requires the Governor of each state to submit to the EPA a list of all areas (or portions thereof) designating those areas as nonattainment, attainment or unclassifiable. Further, EPA is required to designate all areas (or portions thereof) no later than two years following the new NAAQS rulemaking. However, the period of time EPA has to promulgate the designations may be extended by one year if insufficient information exists to make the designations. In the Federal Register notice for the final lead NAAQS rule, EPA recognized that the existing lead monitoring network is insufficient to evaluate attainment for the new NAAQS at locations consistent with EPA's proposed new monitoring network siting criteria and data collection requirements. Many new ambient lead monitors only began operation in January 2010. Therefore, EPA intends to designate nonattainment areas, those with existing violating monitors, in October 2010. In the designations due in October 2011, EPA will promulgate designations for areas not designated by this action.

Technical Analysis

The following technical analysis includes the Missouri counties of Jefferson, Iron, Dent and Reynolds. The Doe Run Company's (Doe Run's) Herculaneum primary lead smelter facility is the source in the EPA-intended Jefferson County nonattainment area, and its Buick secondary smelter and mining and milling facilities are the sources in the EPA-intended Iron County nonattainment area which extends to portions of Dent County to the west and Reynolds County to the south. Jefferson and Iron Counties in the state of Missouri both contain monitors that violate the 2008 Lead NAAQS. Nearby counties or other potential sources for contributions to lead concentrations in the nonattainment area were also considered. EPA has evaluated these counties based on the weight of evidence of the following factors recommended in previous EPA guidance:

- Air quality in potentially included versus excluded areas;
- Emissions and emissions-related data in areas potentially included versus excluded from the nonattainment area, including population data, growth patterns, and emissions controls;
- Meteorology (weather/transport patterns);
- Geography/topography (mountain ranges or other air basin boundaries);
- Jurisdictional boundaries (e.g., counties, air districts, reservations, etc.); and
- Any other relevant information submitted to or collected by EPA.

Jefferson County, Missouri Nonattainment Area

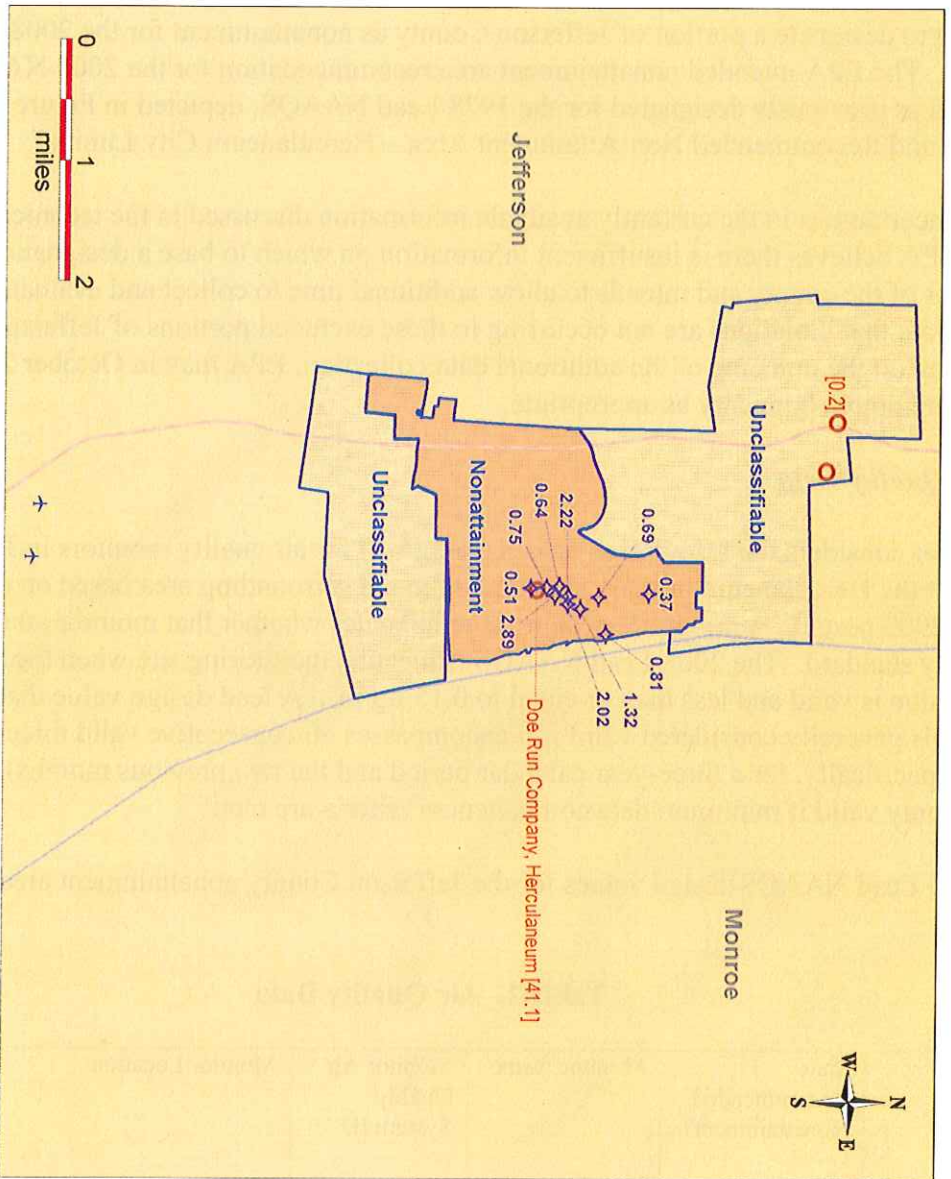
The Doe Run Herculaneum facility is currently the only operating primary lead smelter in the U.S. The facility has been in operation since 1892. The city of Herculaneum is currently designated nonattainment for the 1978 NAAQS. Figure 1 is a map of the area analyzed depicting the location and design value of air quality monitors.

For each revision to a NAAQS EPA is required to conduct a separate designation action, which may result in the same or a different nonattainment boundary.

On December 28, 2009, the State of Missouri recommended that a portion of Jefferson County, Missouri, identified in Figure 1, be designated as "nonattainment" and that two other portions be designated "unclassifiable" for the 2008 Lead NAAQS based on air quality data from 2007 through 2009. The state's recommendation¹ was based on data from Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitors located in Jefferson County and its evaluation of boundary considerations.

¹ Letter from Mark Templeton, Director, Missouri Department of Natural Resources, to William Rice, Acting Regional Administrator, U. S. Environmental Protection Agency, Region VII, dated December 28, 2009.

Figure 1. Herculaneum (Jefferson County, MO)



Legend

- ◆ Violating Monitor (2006-08 design value)
- ◻ Attaining Monitor
- NATA Source (tpy)*
- ✦ Airport (2008 NEI)
- Existing Lead Nonattainment or Maintenance Area
- County Boundary
- State Recommendation
- National Highways

* Sources that are not labeled emitted less than 0.05 tpy.



Recommended boundary is the area within the Herculaneum city limits (as the city limits are defined when this document is adopted on December 3, 2009)

Based on currently available information and EPA's technical analysis described below, EPA is intending to designate a portion of Jefferson County as nonattainment for the 2008 Lead NAAQS. The EPA intended nonattainment area recommendation for the 2008 NAAQS is the same area as previously designated for the 1978 Lead NAAQS, depicted in Figure 2 as the "Current and Recommended Non-Attainment Area – Herculaneum City Limits."

Due to uncertainties in the currently available information discussed in the technical analysis below, EPA believes there is insufficient information on which to base a designation for the remainder of the county and intends to allow additional time to collect and evaluate data to demonstrate that violations are not occurring in these excluded portions of Jefferson County. Depending on the outcome of the additional data collection, EPA may in October 2011 extend the nonattainment boundary as appropriate.

1. Air Quality Data

This factor considers the lead design values (in $\mu\text{g}/\text{m}^3$) for air quality monitors in Jefferson County at the Herculaneum primary smelter and in the surrounding area based on data for the 2007 to 2009 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 2008 Lead NAAQS is met at a monitoring site when the identified design value is valid and less than or equal to $0.15 \mu\text{g}/\text{m}^3$. A lead design value that meets the NAAQS is generally considered valid if it encompasses 36 consecutive valid three-month site means (specifically, for a three-year calendar period and the two previous months). A design value is only valid if minimum data completeness criteria are met.

The 2009 Lead NAAQS design values for the Jefferson County nonattainment area are shown in Table 2.

Table 2. Air Quality Data

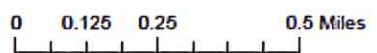
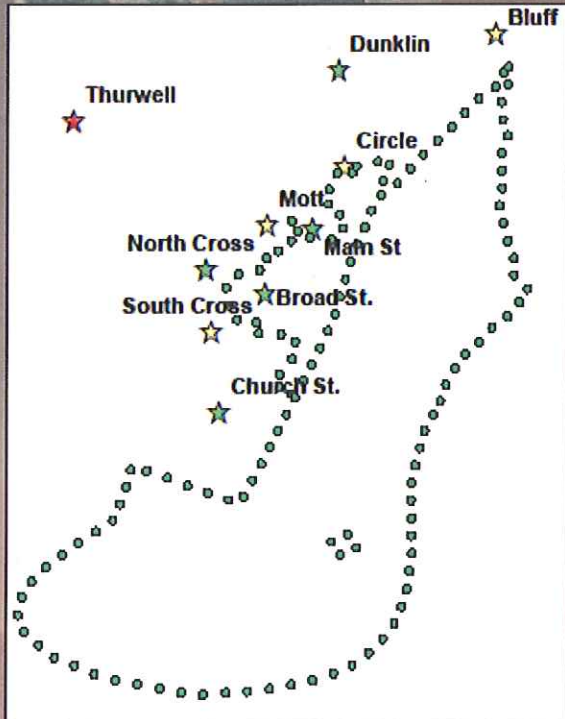
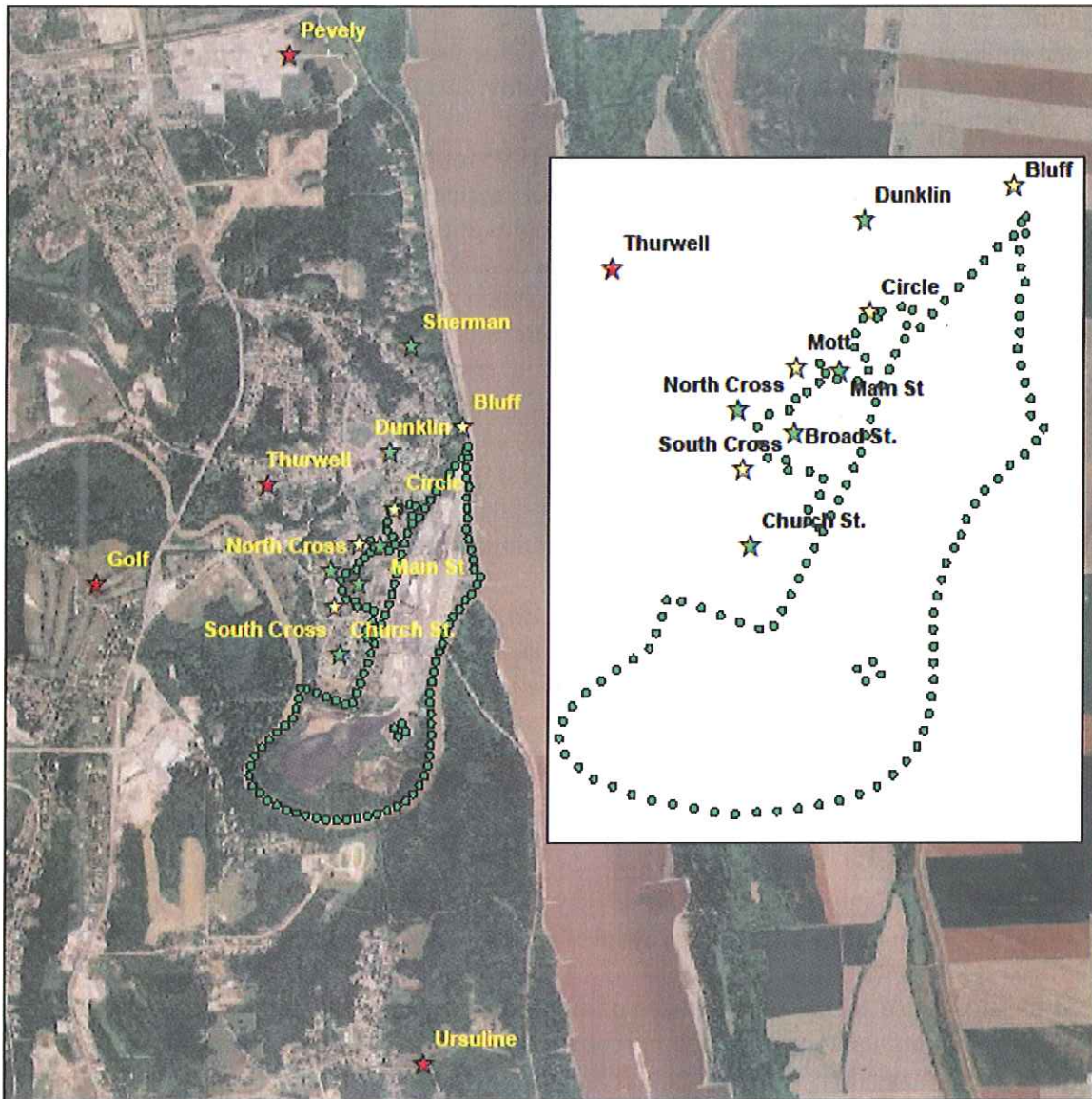
County	State Recommended Nonattainment?	Monitor Name ¹	Monitor Air Quality System ID	Monitor Location	Lead Design Value, 2007-2009 ($\mu\text{g}/\text{m}^3$) ²
Jefferson County (Herculaneum)	Yes (partial)	Bluff	29-099-0011	38.26744, -90.37403	0.85
		Broad St	29-099-0015	38.26182, -90.37867	2.89
		Circle St	29-099-0021	38.26516, -90.37733	1.32
		Dunklin HS	29-099-0005	38.26728, -90.37912	0.73
		Main St ²	29-099-0004	38.26332, -90.37822	2.01

¹ Monitors owned and operated by MDNR

² High values in 2007 and 2008 established the design values for the MDNR monitors

² It should be noted that the Main Street monitor records the highest concentrations for the ambient monitoring locations as the Broad Street monitor is no longer an ambient monitor for purposes of determining compliance with the 2008 Lead NAAQS since it is currently within Doe Run's fenceline.

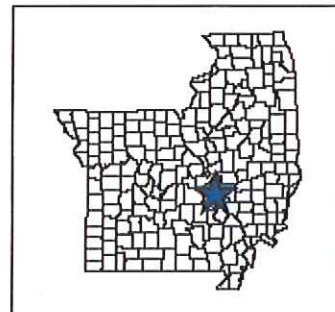
Figure 2. Herculaneum Ambient Air Monitor Locations



Status

- ★ Active
- ★ Discontinued
- ★ to be discontinued


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Monitoring data from the five monitors operated by MDNR in the vicinity of the Herculaneum primary smelter show a violation of the 2008 Lead NAAQS as shown in Table 2 above. There are five additional air monitors operated by Doe Run that also show violations; the Doe Run monitoring results are comparable with the MDNR sites. Because Jefferson County contains at least one ambient monitor that has a Lead Design Value that is above $0.15 \mu\text{g}/\text{m}^3$, the boundary of the nonattainment area is presumed to be the county.

Figure 2 depicts all air monitoring locations from 1995 to the present in the vicinity of the Herculaneum primary smelter. Historic air monitoring results from 1995 to the present indicate that State Implementation Plan (SIP) control strategies at the Herculaneum facility implemented in both 2001 and 2007 resulted in significant reductions in the ambient lead concentrations at these monitoring locations. The 2001 SIP plan included requirements to enclose process buildings, install ventilation systems that filtered gases through high-efficiency baghouse systems, work practice standards, process throughput restrictions and hours of operation limitations. The 2007 SIP plan³ required extensive controls on material handling and delivery systems, additional process controls and ventilation, and provides for the enforcement of the controls in the Work Practices Manual revision. Despite the controls implemented as a part of past SIP revisions, all of the existing monitors (pre-2010) owned and operated by MDNR within the Herculaneum city limits have recorded measurements exceeding the 2008 NAAQS.

In accordance with the Lead NAAQS Final Rule, the presumptive boundary is the entire county with a violating monitor. The State and/or EPA may conduct additional area-specific analyses that could lead to a departure from the presumptive boundary.

Boundaries may be recommended on the basis of one or any combination of the following techniques in addition to the eight-factor analysis:

- Qualitative analysis;
- Spatial interpolation of air quality monitoring data; or
- Air quality simulation by dispersion modeling.

MDNR elected to use spatial interpolation of adjusted ambient air quality data and dispersion modeling for making its boundary recommendation to EPA. EPA evaluated MDNR's analysis and conducted independent verification and analysis as discussed below.

In addition to the five MDNR air monitors located near the Herculaneum smelter facility, there were two ambient air monitors for lead located outside the Herculaneum city limits: Ursuline to the south; and Dow Pevely to the north. The Thurwell monitor was previously located to the northwest and the Golf Course monitor was located to the west of the Herculaneum facility, but within the city limits. These four monitors were discontinued in late 2005 because the results met the 1978 NAAQS which is $1.5 \mu\text{g}/\text{m}^3$. There are no monitoring data for areas outside the existing or state-recommended nonattainment boundary from late 2005 through the end of 2009; however, in January 2010, two monitors were established to replace the Dow-Pevely monitoring

³ "The Doe Run Company Herculaneum Smelter, Herculaneum, Missouri, Work Practices Manual and S.O.P. for Control of Lead Emissions," January 1991, Revised 2000, as amended January 1, 2007. It should be noted that EPA has proposed to conditionally approve the 2007 SIP for Herculaneum, but has not yet taken final action.

site to the north and one monitor was established to the south to replace the Ursuline monitor. Figure 3 depicts the locations of the Dow Pevely, Ursuline, Golf Course, Thurwell and Dunklin air monitors surrounding the Herculaneum facility.

In its TSD,⁴ MDNR used a ratio-based method to estimate the concentrations of lead at the locations of the four monitors discontinued in 2005, two of which are located outside the existing nonattainment boundary, as a part of its technical analysis in support of the boundary recommendation. The MDNR calculated the ratio of every three-month rolling average from 2000 to 2005 for each discontinued monitor to those same averages at the Dunklin High School monitor. After examining the highest, lowest and average ratios for each discontinued monitor, MDNR chose to use the average plus one standard deviation as the factor to adjust the maximum three-month rolling average concentration from the Dunklin High School monitor after 2007 to approximate concentrations at the discontinued monitors for the same time period. More specifically, MDNR multiplied the average ratio plus one standard deviation for each of the four discontinued monitors by the highest post-2007 three-month rolling average concentration from the Dunklin High School monitor (i.e., 0.386 ug/m³) to provide approximations of the highest post-2007 concentrations for all four discontinued monitors. The estimation method used data from the Dunklin High School monitor to estimate post-2005 monitoring results for the discontinued monitors because it is the most distant monitoring location from the source with continuous data. The results of this analysis are provided in Table 3 below.

Table 3. Ratio-Adjusted Historic Monitoring Data for Interpolation

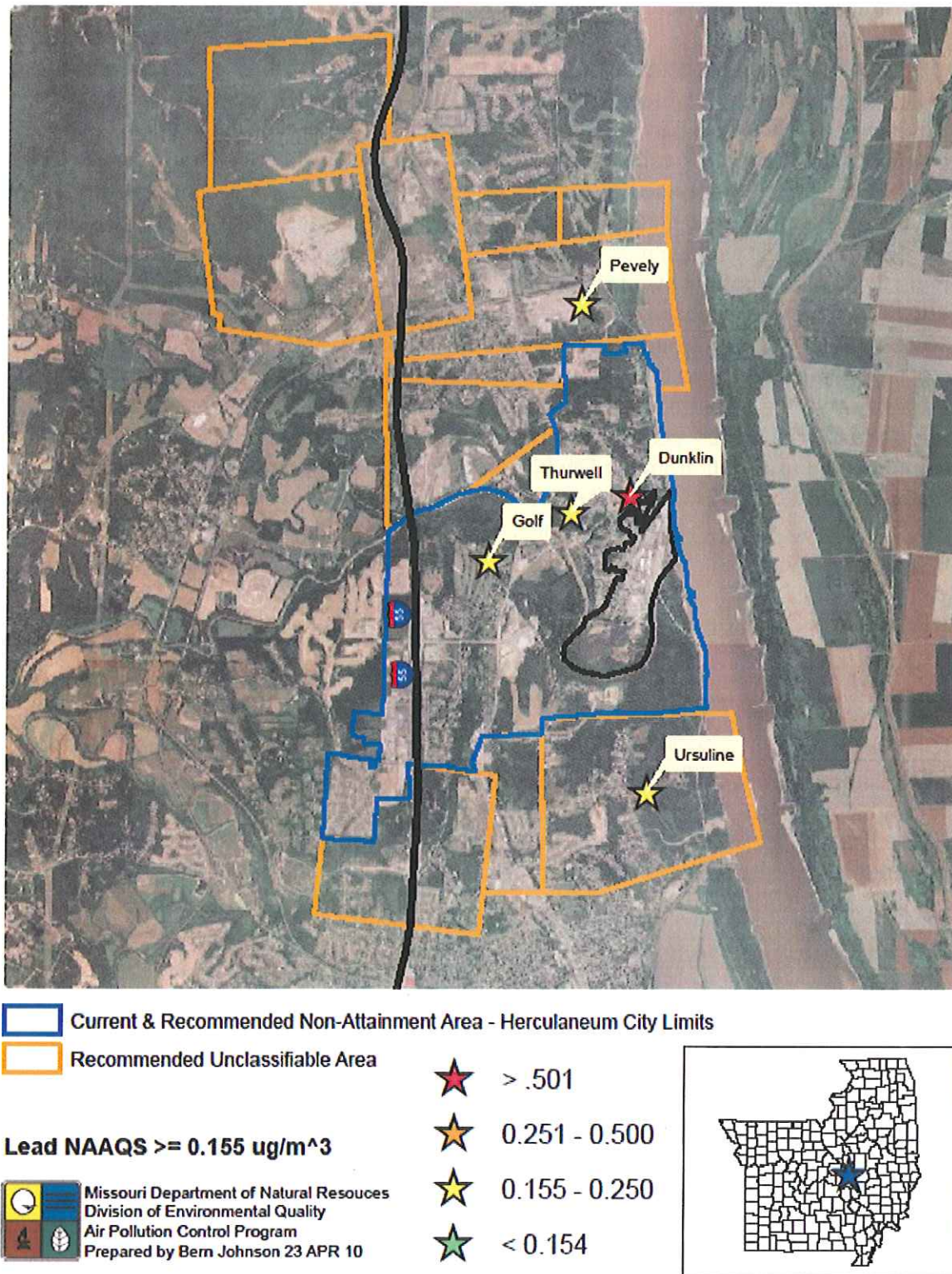
	Dow-Pevely	Golf Course	Ursuline	Thurwell
Max conc (2001)	0.560	0.506	0.251	0.306 ¹
Max Ratio	0.7342	1.1078	0.4503	1.4629
Min Ratio	0.0524	0.0201	0.0185	0.2871
Avg Ratio	0.2268	0.2592	0.1290	0.8928
Std Dev	0.1319	0.2101	0.0793	0.4370
Avg + 1 Std Dev	0.3587	0.4693	0.2083	1.3298
Post-2007 H. S. Max	0.386	0.386	0.386	0.386
Ratio Adj 2007 Conc	0.139	0.181	0.081	0.514
Max 3-month Rolling (post-2001)	0.192 (Feb – Apr 03)	0.232 (Dec 04 – Feb 05)	0.084 (Aug - Oct 02)	0.330 (Nov 04 - Jan 05)

¹ The Thurwell monitor was only operated in 2004 and 2005; the maximum concentration was detected in 2005.

The ratio-based approximations of post-2007 ambient lead concentrations highlighted in bold above, subject to the uncertainties discussed below, suggest compliance with the 2008 lead NAAQS for the two discontinued monitors outside the existing nonattainment boundary for Herculaneum. The ratio-based approximations of the Golf Course and Thurwell monitors located within the EPA-intended nonattainment boundary suggest possible violations of the 2008

⁴ “Technical Support Document for Recommendation of Nonattainment Boundaries in Missouri for the 2008 Lead National Ambient Air Quality Standard,” Missouri Department of Natural Resources, Division of Environmental Quality, Air Pollution Control Program, December 3, 2009.

Figure 3. Location of Herculaneum Air Monitors used for Ratio-Based Estimation⁵



⁵ The data depicted in Figure 3 represent historic (pre-2005) monitoring results.

lead NAAQS. MDNR considers its ratio-based analysis to be conservative because the average plus one standard deviation and the highest recorded concentration from the Dunklin High School monitor after the 2007 state mandated controls were used; this value was recorded in February through April 2009.

The EPA conducted an independent analysis of the correlation of the monitoring data from the Dow-Pevely and Ursuline sites with the data collected from the Dunklin High School monitor utilizing daily values from 2000 - 2005. The Pevely monitor was the focus of the analysis because it is the only monitor outside the proposed nonattainment boundary reporting a violation of the 2008 NAAQS after 2001. The correlation coefficient (R) and the coefficient of determination (R^2) were calculated to determine both how well the data correlate and how well the regression best fits the data. Data that correlate well will have an R value closer to 1.0, indicating unity or perfect correlation. For the coefficient of variation, the higher the R^2 values the greater the number of data points that are close to the best fit line, e.g., 1.0 indicates 100% of the data fit the regression. It should also be noted that the data set was evaluated to eliminate void, missing and/or extra data to ensure a valid comparison for specific dates at each site.

Table 4. Analysis of Correlation (R) and Coefficient of Determination (R^2) for Pevely and Dunklin High School Lead Monitoring Results from 2000 - 2005

Year	Correlation (R)	Coefficient of Determination (R^2)
2000	0.72	0.52
2001	0.57	0.32
2002	0.35	0.12
2003	0.05	0.003
2004	0.35	0.12
2005	0.26	0.07

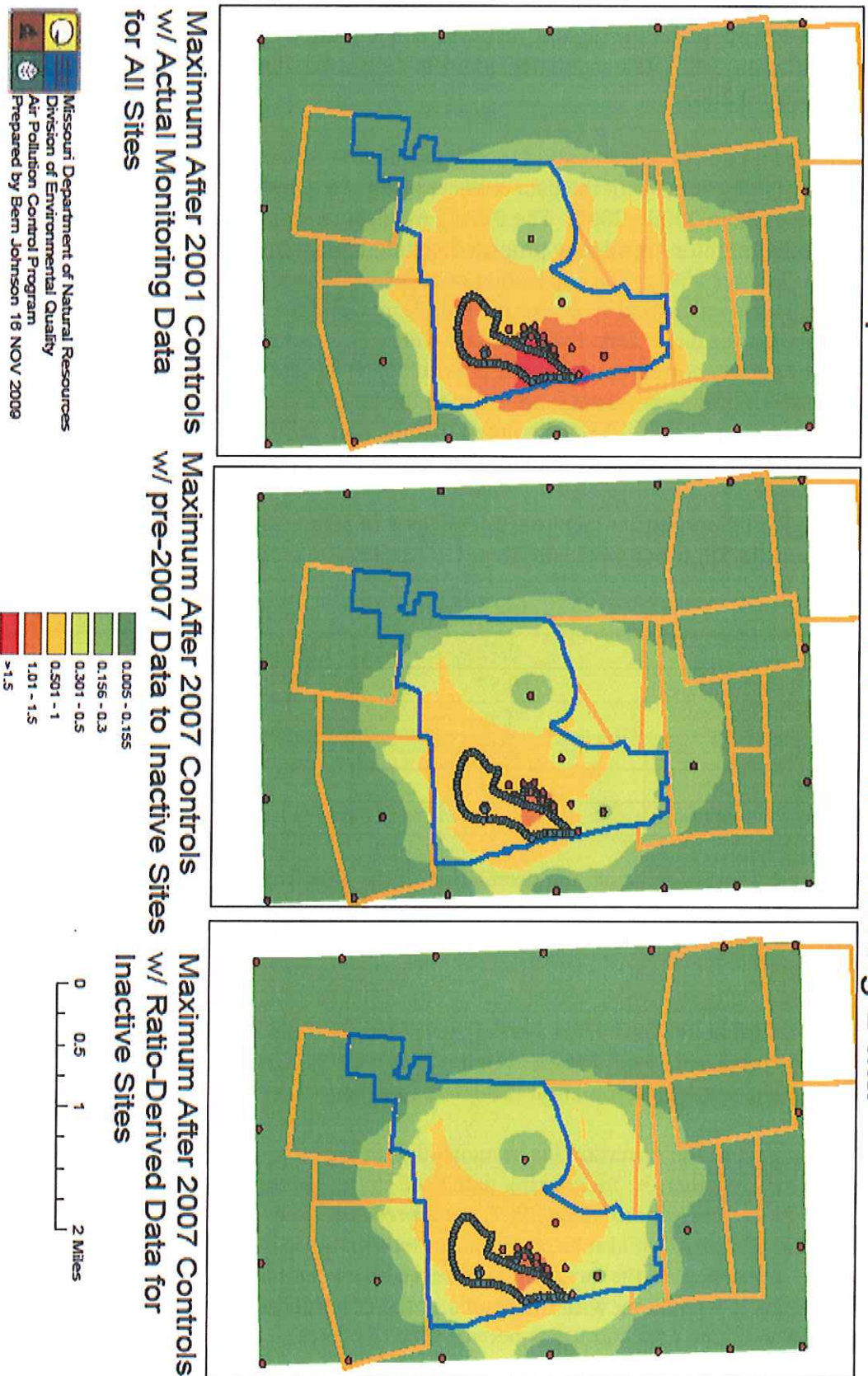
As the data in Table 4 above indicate, the correlation of the data from the Dow Pevely and Dunklin High School monitoring sites is not very strong. The correlation between the two data sets is most likely affected by meteorological conditions, particularly wind speed and direction, and emissions activity.

MDNR provided a further analysis using spatial interpolation of the ratio-based estimation of lead concentrations predicted to be measured in the Dow Pevely, Ursuline, Thurwell and Golf Course monitors. The spatial interpolation is depicted in Figure 4 below.

This analysis is subject to the uncertainties associated with the ratio-derived data, and additional uncertainties, such as whether the monitoring data used in the spatial interpolation which are the highest three-month concentrations since 2001, are representative of post-2007 ambient concentrations, and whether spatial interpolation can reasonably estimate air quality around the Doe Run facility. In particular, the large range observed between the minimum and maximum ratio at the Dow-Pevely site, along with the results of the correlation analysis, indicate the high degree of variability of lead concentrations between the two sites.

Figure 4. Interpolation of Herculaneum Monitoring Data

Interpolation of Herculaneum Monitoring Data



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As discussed above, the four peripheral air monitors were discontinued after 2005 because these locations consistently monitored attainment with the 1978 NAAQS. In January 2010, MDNR resumed lead air monitoring at the Pevely and Ursuline locations. Preliminary data obtained from MDNR indicate that for the first quarter of calendar year 2010, the average concentration of ambient lead measured in the Ursuline and Dow-Pevely monitors is 0.033 ug/m³ and 0.023 ug/m³, respectively. The Pevely-North monitor which is northwest of the Dow-Pevely monitor location measured 0.031 ug/m³. Uncertainties associated with the use of the 2010 monitoring data include the temporal limits of the data, as only one quarter of data have been collected thus far. Also, the data were collected during the winter months in which the predominant wind direction was from the north, which likely would result in lower concentrations in the Pevely monitor and higher in the Ursuline monitor. The Agency will continue to evaluate to evaluate new data as it becomes available.

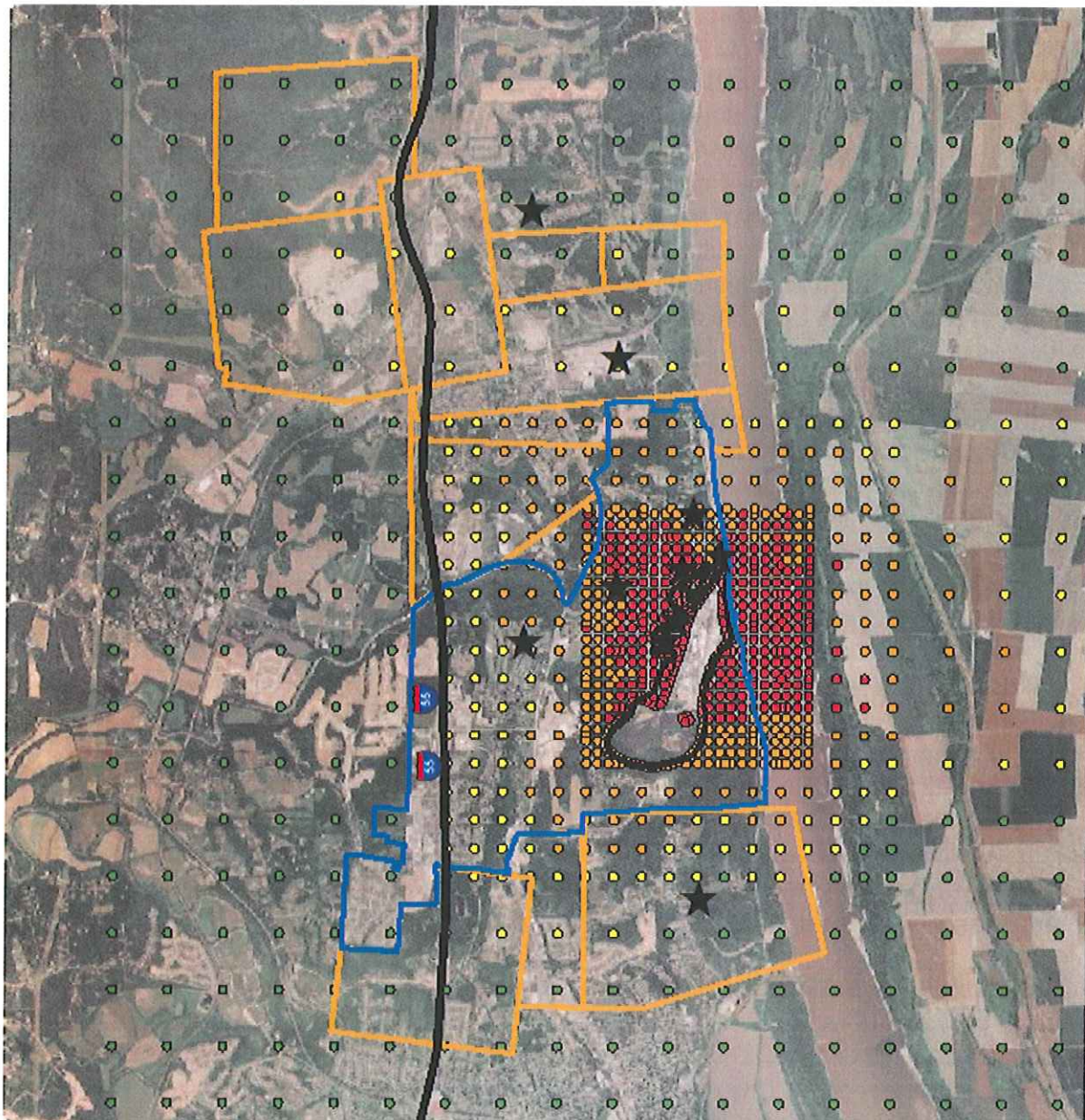
In addition to ratio-derived estimation and spatial interpolation of the monitoring data, MDNR also conducted extensive dispersion modeling of ambient lead concentrations presented in Figure 5. The city limits of Herculaneum, the existing nonattainment boundary, are depicted in blue; the orange blocks are incorporated areas of Pevely to the north and Festus and Crystal City to the south. The blocks represent a mixture of sections that are identified by township, range and section, and historic land grant areas. The dots on the figure denote the receptor grid used in the model, with each receptor color-coded according to the concentrations of lead predicted.

MDNR used AERMOD, EPA's preferred dispersion model for the analysis conducted. The modeling was performed for the time period of 2007 – 2009 using maximum production rates for the Herculaneum smelter. It included on-site meteorological data for ground-level analyses, and data from the airport in Lincoln, Illinois for the upper atmospheric meteorological analyses. All of the meteorological data were quality-assured. Fugitive emissions from haul route traffic and buildings were included in the model. EPA conducted an independent review of MDNR's model⁶ and determined that while there are some areas for improvement, the modeling effort was comprehensive and done in accordance with EPA modeling guidance.


Violations of the NAAQS were predicted in all directions from the facility with the highest estimated concentrations adjacent to the facility. There is a sharp decrease in the lead concentrations as the distance from the facility increases, as would be predicted based on the physical properties of lead. The model predicts potential violations of the 2008 NAAQS outside the existing and state recommended nonattainment boundary. While it is acceptable to use modeled lead concentrations as one component of the analysis to determine the boundaries of the Jefferson County nonattainment area, one significant uncertainty with the modeling conducted by the State is the use of maximum allowable production levels under MDNR's 2007 SIP revision³ rather than actual operating conditions. The modeled emissions were 158.66 TPY; whereas, the average actual emissions from 2007 - 2009 are 18.33 TPY (see Table 6 below).

⁶ Memorandum from Richard Daye, EPA, to Stephanie Doolan, EPA, dated April 30, 2010, re: Modeling Review of Doe Run Herculaneum and Buick/Viburnum, Missouri Areas.





Figure 5. Herculaneum Modeled Lead Concentrations



 Current & Recommended Non-Attainment Area - Herculaneum City Limits

 Recommended Unclassifiable Area

ug/m³

-  >0.500
-  0.251 - 0.500
-  0.155 - 0.250
-  <0.154

Lead NAAQS \geq 0.155 ug/m³

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2. Emissions and Emissions-Related Data

Evidence of lead emissions sources surrounding a violating monitor are an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county level emission data for lead and population data.

Emissions data that appear on Figure 1 and in Table 5 below were derived from the 2002 National Air Toxics Assessment (<http://www.epa.gov/ttn/atw/natamain/>). EPA recognizes that for certain sources, emissions may have changed significantly since 2002. For example, certain large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2002. Figure 1 indicates two facilities in Pevely, Missouri, reporting lead emissions. The facility to the northwest of Herculaneum reporting lead emissions of 0.2 TPY is Saint Gobain Container, and the facility to the east of it identified in the legend on Figure 1 as reporting less than 0.2 tons per year (TPY) lead emissions is Alcoa Composition. EPA verified emissions reported for these facilities with the 2007-2009 state emissions inventory (MoEIS). These facilities are approximately 1.5 miles from the violating monitor in Jefferson County. Neither of these facilities is believed to be influencing the monitors due to their distance and the quantity of emissions reported relative to the quantity of the emissions from and the proximity of the Herculaneum facility to the monitor. As a result, neither Alcoa nor Saint Gobain were considered further in this technical analysis.

There are approximately 20,000 airport facilities in the U.S. at which leaded aviation gasoline is consumed. Piston-engine propeller type airplanes use the lead aviation gasoline, so EPA and MDNR considered the potential for the Festus Memorial Airport to impact the Herculaneum nonattainment area. Based on the airport's distance, 4 miles to the south, and the reported emissions, 40 pounds (lbs) of lead for 2008, EPA does not believe that Festus Memorial Airport contributes to the recommended nonattainment area. Note that there are two airplane symbols on Figure 1; one is for Festus Memorial Airport and the second is for an associated heliport.

Table 5 shows total emissions of lead (given in TPY) for violating and potentially contributing counties in and around the Herculaneum nonattainment area and sources emitting greater than 0.5 ton per year of lead according to the 2002 NATA and 2007-2009 MoEIS. Based on the 2002 NATA and MoEIS, there are no other sources of lead emissions either within or outside Jefferson County that are contributing to the recommended nonattainment area for the 2008 Lead NAAQS.

Table 5. Lead Emissions

County	Facility in State Recommended Nonattainment Area?	Facility – Total Air Emissions ¹ (tons per year)	Facility	Total County Lead Emissions (tons per year)
Jefferson County	Yes	41.1 ¹	Herculaneum Primary Smelter	41.3
Jefferson County	No	0.2	Saint Gobain Container	41.3
Jefferson County	No	<0.2	Alcoa Composition	41.3

¹ – National Air Toxics Assessment (NATA) 2002

For comparison, EPA reviewed the emissions inventory information reported by Doe Run for years 2000 – 2002 in its responses to the State’s Emission Inventory Questionnaires. Information for 2003 – 2009 is from MDNR’s MoEIS database. The emissions data are presented to examine the trends in emissions in comparison with the historic monitoring data discussed above. As Table 6 indicates, the lead emissions from the Herculaneum smelter have decreased significantly from 2000 – 2009, corresponding with but proportionately larger than the significant decrease in lead production.

Table 6. Herculaneum Smelter Production

Year	Lead Production (TPY)	Lead Emissions TPY ^{1,2}
2000	243,516	125.8 ¹
2001	203,262	110.4 ¹
2002	143,265	58.18
2003	150,550	25.1 ²
2004	163,736	26.0 ²
2005	154,969	28.1 ²
2006	168,301	26.4 ²
2007	136,573	21.81 ²
2008	144,799	19.19 ²
2009	114,298	13.99 ²

¹ - Emission Inventory Questionnaire reported by Doe Run Company

² Emissions reported from MoEIS database

As a part of MDNR's 2007 SIP revision³, modeling was conducted which forms the basis for the modeling used by MDNR in its TSD⁴ for its boundary recommendation. MDNR used hourly emissions by department developed by Doe Run⁷. The hourly emissions study calculated emissions originating from the facility's lead concentrate unloading department, sinter plant, blast furnace (including main stack), dressing plant, and refinery strip rolling mill, including fugitive emissions from each of these departments. Fugitives from wind-blown erosion from storage piles and re-entrainment of dust from paved and unpaved haul routes were calculated as a separate category. Fugitive emissions from wind-blown erosion from storage piles and deposition/re-entrainment of lead-contaminated dust along haul routes represents approximately 7% of the total facility emissions. Due to the significance of this source of lead to the ambient air, it is important to note that the Jefferson County intended nonattainment area designation includes the main haul routes from the Herculaneum smelter facility to the city boundary.

3. Population Data

Table 7 shows the 2008 population for Jefferson County, Missouri, which includes the proposed Herculaneum nonattainment area. These data help assess the extent to which the concentration of human activities in the area and concentration of population-oriented commercial development may indicate emissions-based activity contributing to elevated ambient lead levels. This may include ambient lead contributions from activities that would resuspend lead that has been deposited on the ground or on other surfaces, such as fugitive emissions from the lead concentrate haul routes.

Table 7. Population Data

County	State Recommended Nonattainment?	2008 Population	2008 Population Density (pop/sq mi)	Population Change 2000-2008	Population % Change 2000-2008
Jefferson Co., Missouri	Yes, partial	217,679	328	18,941	10

Source: U.S. Census Bureau estimates for 2008 (<http://www.census.gov/popest/datasets.html>)

The areas surrounding the Herculaneum smelter are not more densely populated that surrounding areas such as Pevely, Crystal City and Festus. The area may be characterized as predominantly residential or light commercial/industrial. EPA does not believe that the population data provided in the analysis of this factor affect the boundary recommendation.

⁷ "2005 Hourly Lead Emission Inventory for Doe Run's Herculaneum, Missouri Smelter," Shell Engineering and Associates, Inc., February 1, 2007.

4. Growth Rates and Patterns

This factor considers population growth for 2000-2008 in the area considered for the nonattainment designation. Table 8 below shows population, and population growth for Jefferson County, Missouri. All population data is from the U.S. Census Bureau http://www.census.gov/popest/counties/CO-EST2008-popchg2000_2008.html.

Table 8. Population and Percent Change

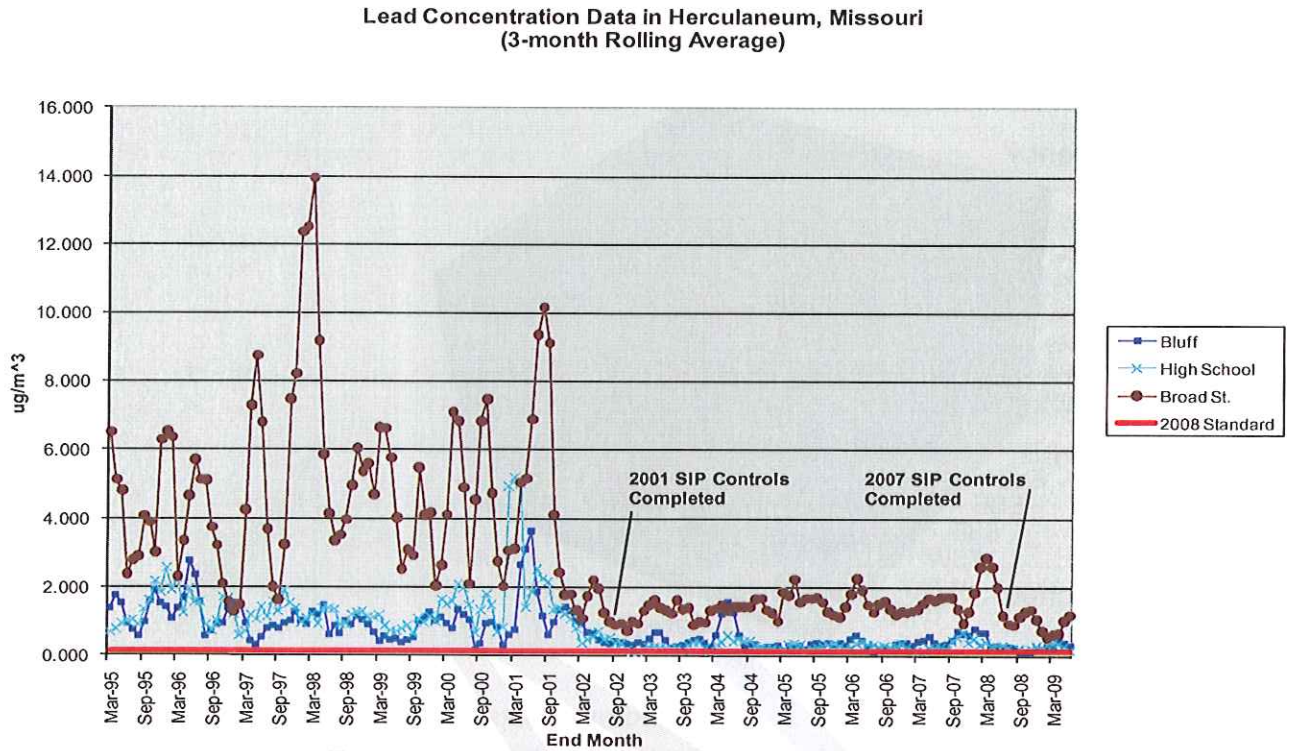
Location	Population (2008)	Population Density (2008)	Population % change (2000 - 2008)	Absolute change population
Jefferson County, Missouri	217,679	328	10	10%

Jefferson County, Missouri had a moderate population growth between 2000 and 2008. Growth in new residential housing and commercial/light industrial facilities is evident, particularly along the I-55 highway corridor. This is most likely due to proximity to St. Louis, Missouri. EPA has considered the population growth rate for this area and does not believe that it affects the boundary recommendation.

5. Emissions Controls

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Tables 5 and 6 above represent emissions levels taking into account any control strategies implemented for the existing Herculaneum nonattainment area for the 1978 NAAQS. As discussed above, there were SIP mandated controls placed on the facility in 2001 and state-mandated controls in 2007 resulting in significant reductions in the Herculaneum smelter emissions, as demonstrated in Figure 6 below. Lead concentrations at the monitors are affected by the amount of lead produced and subsequent emissions from the Herculaneum smelter facility. While the 2001 (implemented in 2002) and 2007 controls do not bring Jefferson County in attainment with the 2008 NAAQS, it is apparent that lead concentrations measured in the monitors close to the smelter facility are greatly reduced. The other small lead sources in the area do not have regulatory controls for lead, but are not expected to be contributing to nonattainment in the area.

Figure 6. Ambient Lead Concentrations at Herculaneum, 1995 – 2009

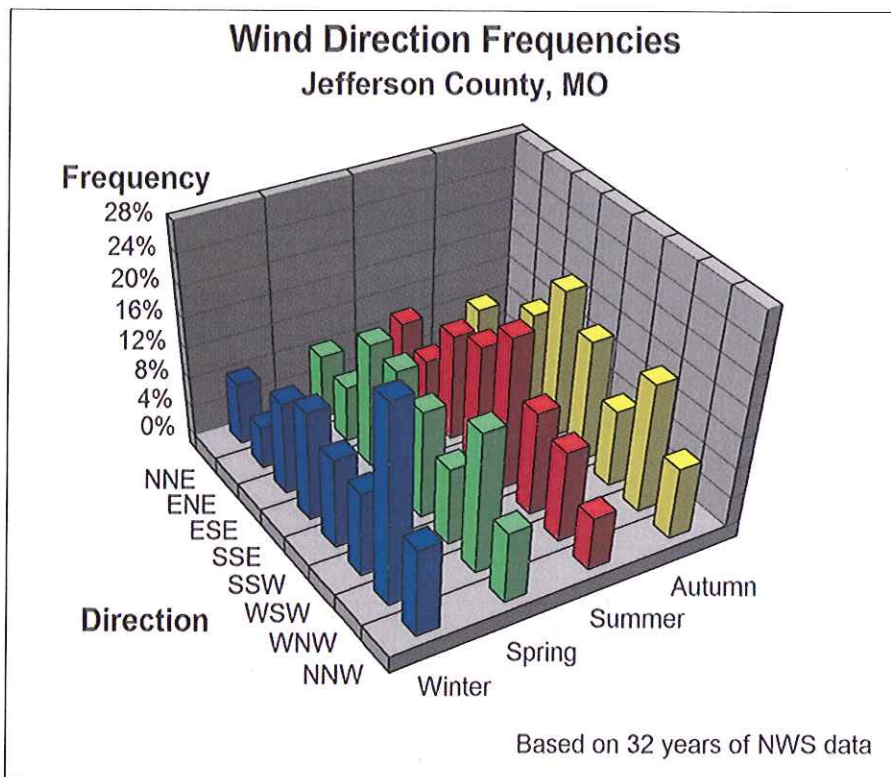


6. Meteorology

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction data for are depicted in Figure 7 below.

The three-dimensional bar chart below shows the wind frequencies in eight directions for the four seasons. The chart frequencies reflect the directions from which the winds come. Based on Figure 7, it may be concluded that the wind originates predominately from the WNW in the winter months and from the SSW during summer months. These meteorological conditions are typical of areas along the Mississippi River valley. As discussed above, on-site surface meteorological data were used in the lead concentration modeling analysis. There are lead air monitors located both north and south of the smelter facility, so regardless of the season, monitoring is expected to detect lead in the ambient air. The Jefferson County nonattainment boundary recommendation is supported by the meteorological data.

Figure 7. Herculaneum Historic Meteorological Data



Source: 1960-1992 Solar and Meteorological Surface Observation Network information issued jointly by the U.S. Department of Commerce: National Climatic Data Center and the U.S. Department of Energy: National Renewable Energy Laboratory

7. Geography/Topography

The geography/topography analysis evaluates the physical features of the land that might have an affect on the air shed and, therefore, on the distribution of lead over the proposed Herculaneum nonattainment area.

The Jefferson County nonattainment area lies in the Mississippi River valley which affects meteorological conditions, as discussed in Section 6 above. The area is characterized by wooded bluffs to the north and south of the facility, while the area west of the facility is residential with less topographic relief. To the east across the Mississippi River, the area is largely crop land with few houses. EPA believes that the geographical or topographical features of the area do not significantly limit air-pollution transport within its air shed, but rather that it creates a mild tunnel effect for winds originating from the north in winter and from the south in summer months. Therefore, this factor did not play a significant role in determining the nonattainment boundary.

8. Jurisdictional boundaries

Existing jurisdictional boundaries may be helpful in articulating a boundary for purposes of nonattainment designations, and for purposes of carrying out the governmental responsibilities of planning for attainment of the lead NAAQS and implementing control measures. These existing boundaries may include an existing nonattainment or maintenance area boundary, a county or township boundary, a metropolitan area boundary, an air management district, or an urban planning boundary established for coordinating business development or transportation activities.

The City limits of Herculaneum, Missouri, is the jurisdictional boundary which defines the recommended nonattainment area. Areas to the north include the incorporated limits of Pevely, and areas to the south include Festus and Crystal City. The orange lines on Figure 2 indicate a number of jurisdictional boundaries for the areas to the north and south of Herculaneum. These areas include townships, sections, and land grant designations. These jurisdictional boundaries were considered in determining the appropriate boundary.

9. Other Relevant Information

EPA received additional information from the State relevant to establishing a nonattainment area boundary for this area. As discussed in Section 1, Air Quality, above, MDNR submitted modeling analysis and spatial interpolation of air monitoring data in support of its boundary recommendation. EPA considered this information and conducted an independent analysis in making its proposed boundary recommendation for the Herculaneum lead nonattainment area.

Summary

EPA intends to designate that portion of Jefferson County Missouri which coincides with the Herculaneum city limits as identified in Figures 1 and 2 as the nonattainment area for the 2008 Lead NAAQS. This is the same area previously designated as nonattainment for the 1978 Lead NAAQS.

Five air quality monitors operated by MDNR in Jefferson County surrounding Doe Run's Herculaneum smelter facility show violations of the 2008 Lead NAAQS based on 2007 - 2009 air quality data. Therefore, a nonattainment designation is required for all or some of Jefferson County. EPA has considered all eight factors and other relevant information submitted by MDNR to help determine an appropriate boundary. Other relevant information considered includes ratio-derived estimation and spatial interpolation of historic monitoring values at locations of discontinued monitors north and south of the existing lead nonattainment area for the 1978 NAAQS and dispersion modeling conducted by MDNR. In addition to the historic monitoring data, EPA considered preliminary data from January through March 2010 for three new monitors placed at the locations of the historic Dow Pevely monitor to the north and the Ursuline monitor to the south.

The available monitoring data indicate that the existing nonattainment boundary for the 1978 NAAQS captures the existing monitored violations. It also includes all the significant lead emitting facilities and activities within the county line: the Doe Run primary smelting facilities

and related operations. EPA has considered MDNR's spatial interpolation and concludes that the uncertainties associated with this analysis are so significant that the interpolation does not provide a reliable basis for designations.

EPA has a high degree of confidence in the results of the dispersion model because of the quality and quantity of data used. However, because the model uses maximum emissions at this facility, EPA believes the modeling results likely overestimate the extent of the 2008 NAAQS violations, although EPA has very little information with which to judge the degree of overestimation. Also, as discussed in the text, EPA notes that there are uncertainties associated with the use and interpolation of the historic monitoring data from the peripheral monitoring sites. Given the uncertainty in the modeling results, EPA is relying more upon the monitoring data than the modeling to inform the boundary.

In summary, considering all of the technical information presented, and placing greater emphasis on the monitoring data, EPA intends to designate the portion of Jefferson County consistent with the Herculaneum city limits as the 2008 NAAQS nonattainment boundary. Based on its consideration of all the relevant, available information, as described above, EPA believes that the boundaries described herein encompass the entire area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the 2008 Pb NAAQS. As discussed above, due to the uncertainty in the interpolated monitoring and modeling data for the areas outside the Herculaneum city limits, EPA intends to allow time to collect and evaluate additional data from the new monitoring sites, and conduct additional analyses, as appropriate. The area will be re-evaluated in the second round of designations taking into consideration all newly available data and information.

Iron, Dent and Reynolds Counties, Missouri Nonattainment Area

As discussed in the Introduction, Doe Run also owns and operates the Buick secondary smelter facility near Bixby, Missouri in Iron County. The Buick facility initially began operation as a primary smelter in 1968. Since 1991, the Buick facility has operated as a secondary smelter for recycling lead, primarily from lead-acid storage batteries. Buick is also the only location in the U.S. for recycling lead from cathode ray tubes from televisions and computer monitors.

In 1991, western Iron County was designated nonattainment, effective in 1992. In October 2000, western Iron County was redesignated as attaining the 1978 Lead NAAQS. In August 2004, the Buick facility's maintenance plan was approved by EPA by final rulemaking. Iron County has been in attainment of the 1978 NAAQS until the fourth quarter of 2008. Following the 2008 exceedences of the 1978 Lead NAAQS, contingency measures identified in the facility's approved maintenance plan have been implemented.

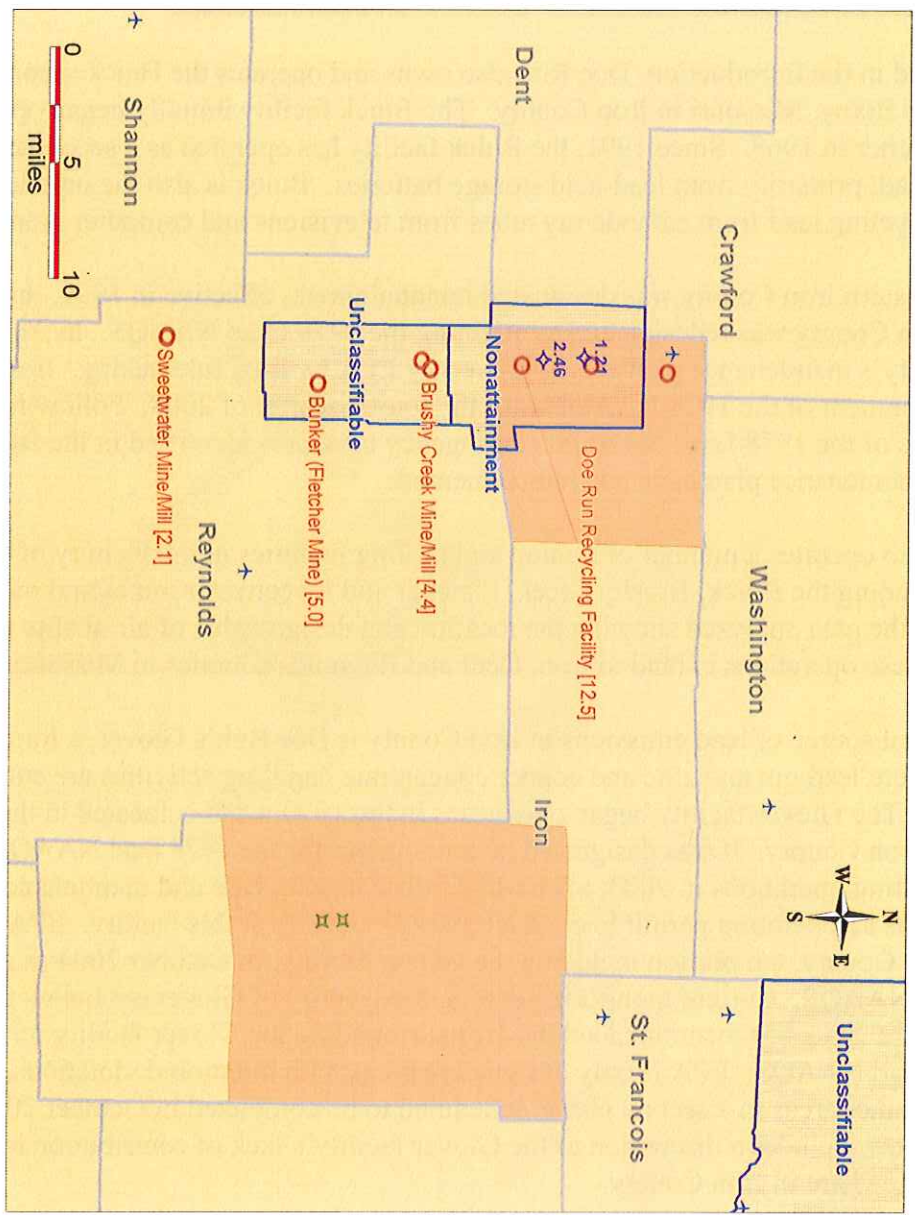
Doe Run also operates a number of mining and milling facilities in the vicinity of the Buick facility including the Buick, Brushy Creek, Fletcher and Sweetwater mines and mills. Figure 8 is a map of the area analyzed showing the location and design value of air quality monitors. Note that these operations extend to Iron, Dent and Reynolds counties in Missouri.

An additional source of lead emissions in Iron County is Doe Run's Glover, a former primary smelter, where lead ore and zinc and copper concentrate handling activities are currently conducted. The Glover facility began operations in the 1970's and is located in the southeastern portion of Iron County. It was designated nonattainment for the 1978 lead NAAQS in 1992 and ceased smelting operations in 2003, after which it has been in care and maintenance. Doe Run no longer has an operating permit to conduct pyro-processing at this facility. EPA designated eastern Iron County, the portion including the Glover facility, in October 2004 as attaining the 1978 Lead NAAQS. Current monitoring data in the vicinity of Glover are below the new standard. The State has recommended the area surrounding the Glover facility for attainment of the 2008 Lead NAAQS. EPA is only designating areas with monitored violations, and will address all other areas in a second phase, scheduled to be completed in October 2011. The analysis below includes a discussion of the Glover facility's lack of contribution to the violating monitors elsewhere in Iron County.

On December 28, 2009, the State of Missouri recommended that portions of western Iron, Dent and Reynolds Counties in Missouri, identified in Figures 8 and 9, be designated as "nonattainment" and "unclassifiable" for the 2008 Lead NAAQS based on air quality data from 2007 through 2009. The state's recommendation¹ was based on analysis of monitoring and modeling data.

Based on EPA's technical analysis described below, EPA is intending to designate portions of Iron, Dent and Reynolds Counties as nonattainment for the 2008 Lead NAAQS, based upon currently available information. The area recommended by MDNR as "unclassifiable" on Figure 9 will be considered by EPA in its October 2011 designations.

Figure 8. Buick/Viburnum Trend (Dent, Iron & Reynolds Counties, MO)



Legend

- ◆ Violating Monitor (2006-08 design value)
- ◻ Attaining Monitor
- NATA Source (tpy)*
- + Airport (2008 NEI)
- Existing Lead Nonattainment or Maintenance Area
- County Boundary
- State Recommendation
- National Highways

* Sources that are not labeled emitted less than 0.05 tpy.

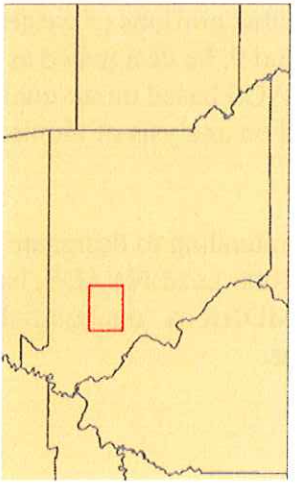
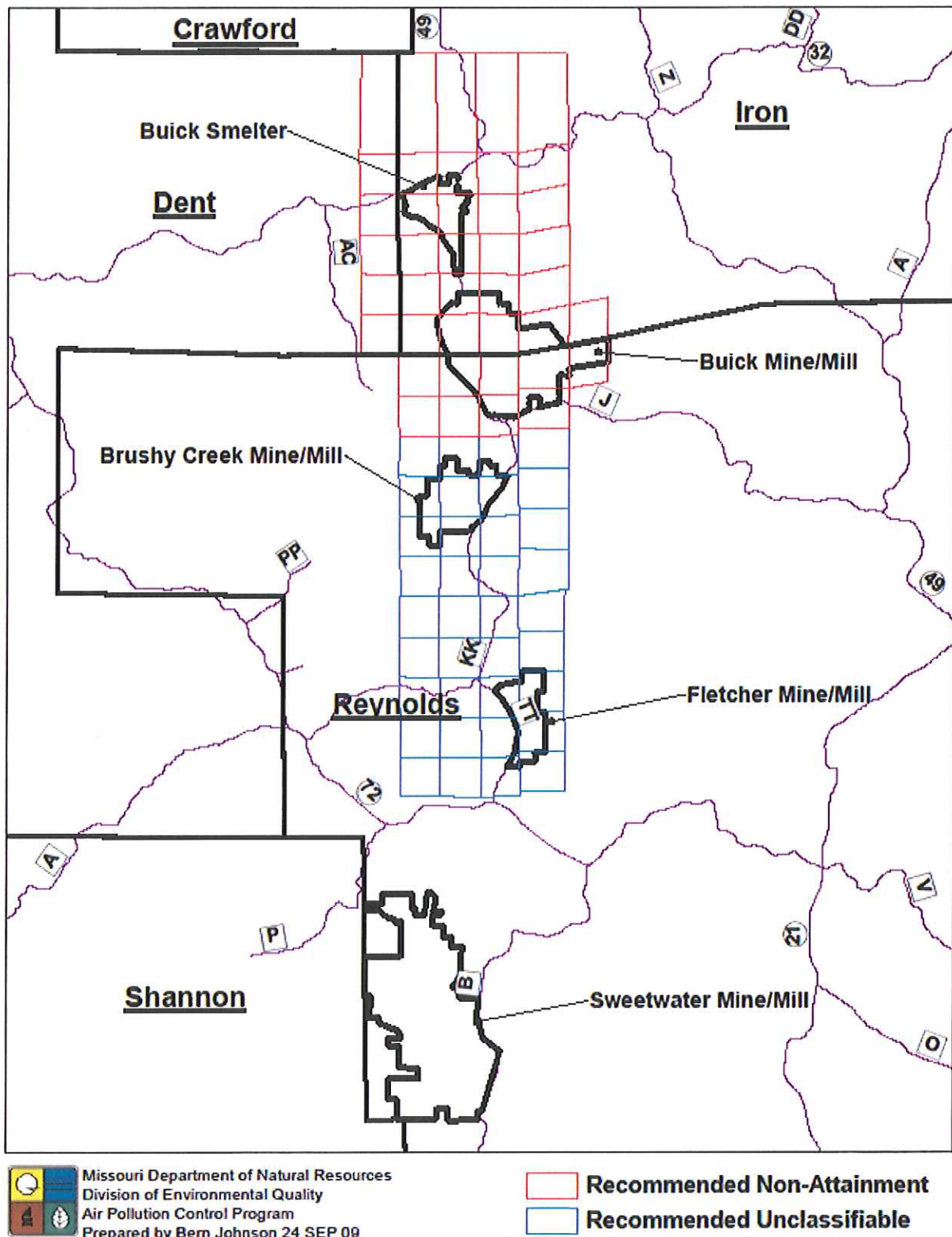


Figure 9. Iron, Dent & Reynolds County Lead Nonattainment Recommendation



1. Air Quality Data

This factor considers the Lead Design Values (in $\mu\text{g}/\text{m}^3$) for air quality monitors in western Iron County at the Buick secondary smelter and in the surrounding area, and southeastern Iron County around the Glover facility, based on data from 2007-2009. The monitors used for determining compliance with the regulatory standard are FRM or FEM monitors located in Iron County. As discussed above, a monitor's design value indicates whether that monitor attains a specified air quality standard; in this case the 2008 lead NAAQS.

The 2009 Lead NAAQS Design Values for the monitors in Iron County and surrounding area are shown in Table 9.

Table 9. Iron, Dent and Reynolds Counties Air Quality Data

County	State Recommended Nonattainment?	Monitor Name	Lead Design Value, 2007-2009 ($\mu\text{g}/\text{m}^3$)
Iron, Dent & Reynolds	Yes (partial)	Buick South	2.46
Iron	No	Post Office	0.13

Iron County, Missouri shows a violation of the 2008 Lead NAAQS for the monitor listed in Table 9 above in the vicinity of the Buick smelter, mine and milling operations. Because the county contains at least one ambient monitor that has a Lead Design Value that is above $0.15 \mu\text{g}/\text{m}^3$, the boundary of the nonattainment area is presumed to be the county.

The highest measured design value for monitors in the vicinity of the Glover facility is also included in Table 9 above. The air monitoring data from monitors in the vicinity of the Glover facility show attainment with the 2008 NAAQS for 2007-2009.

Figure 10 depicts the active air monitors, Buick North and South, that currently exceed the 2008 NAAQS, as well as the new monitors for the mining and milling operations that began operating in January 2010. Historically, there were two additional air monitors located to the northwest of Buick that also monitored violations of the 2008 NAAQS. These monitoring locations were discontinued in 2001. The Buick South monitor has historically recorded higher concentrations of lead than the other monitoring stations, with the highest concentration of $2.46 \mu\text{g}/\text{m}^3$ detected in the October – December calendar quarter of 2008. This exceedence set the design value.

MDNR used AERMOD to conduct a dispersion model analysis to predict lead concentrations in the vicinity of the Buick smelter, mine and mill and for the other mining and milling operations in the Viburnum Trend area. The maximum permitted emissions were used to model the Buick smelter emissions. Fugitive emissions from haul route traffic and buildings were included in the model. In addition, MDNR conducted a "stack" test at one of the mine shaft vents to gather data to represent emissions from the mines for use in the model. The Buick/Viburnum Trend modeling results are depicted on Figures 11 and 12 below.

Figure 10. Iron, Dent, and Reynolds County Air Monitor Locations

Viburnum Trend Facility Boundaries and Proposed Monitoring Sites

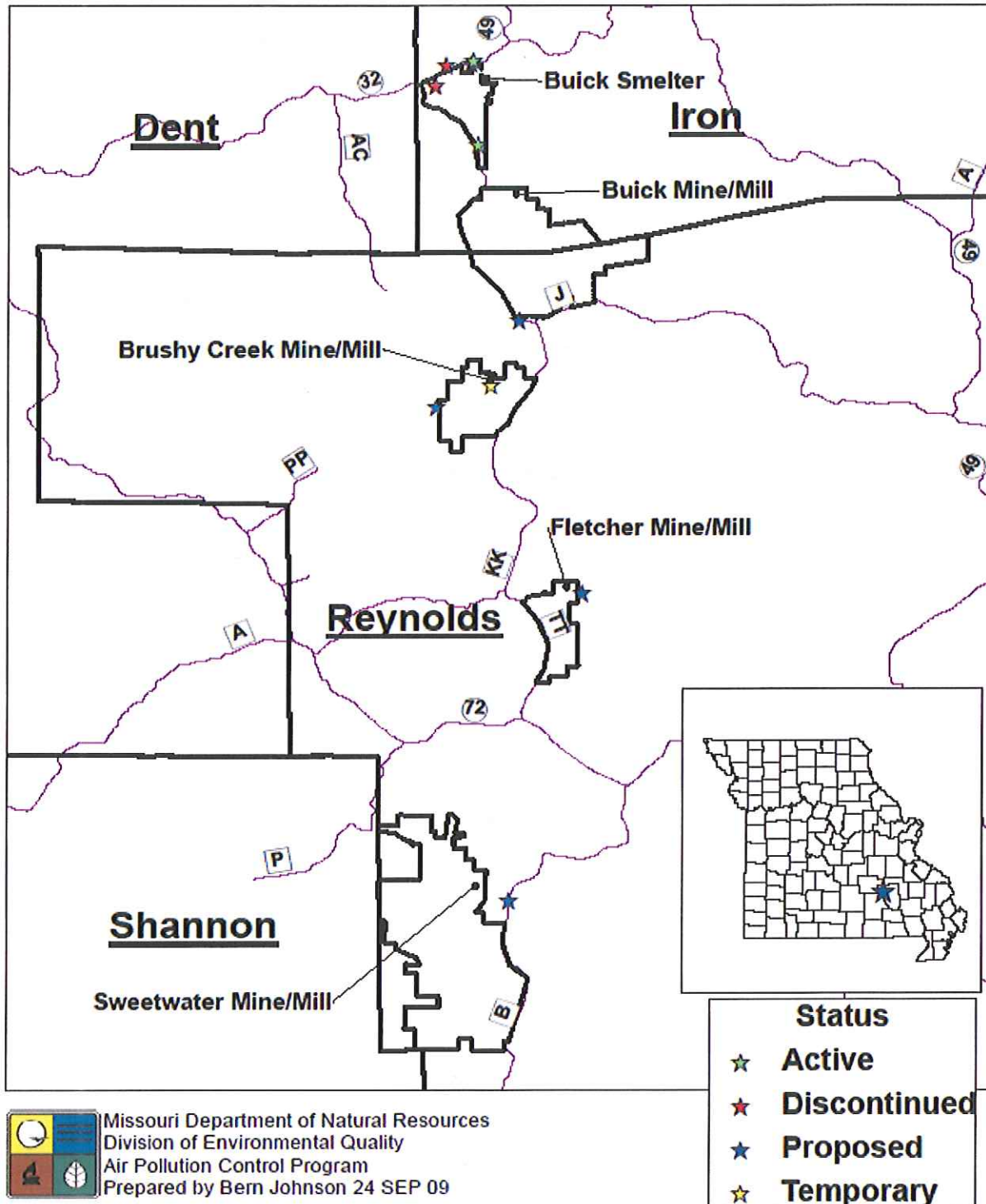
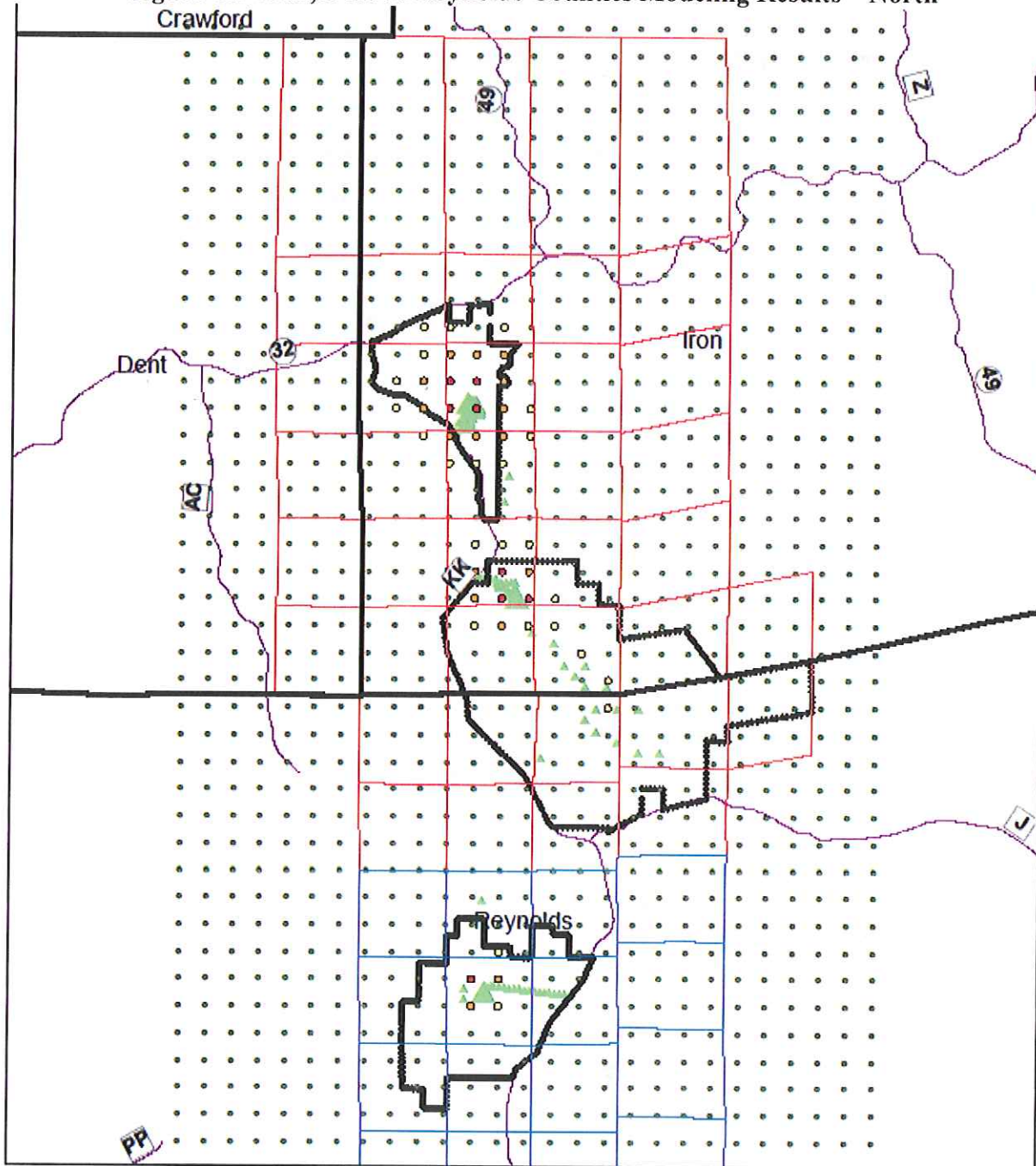
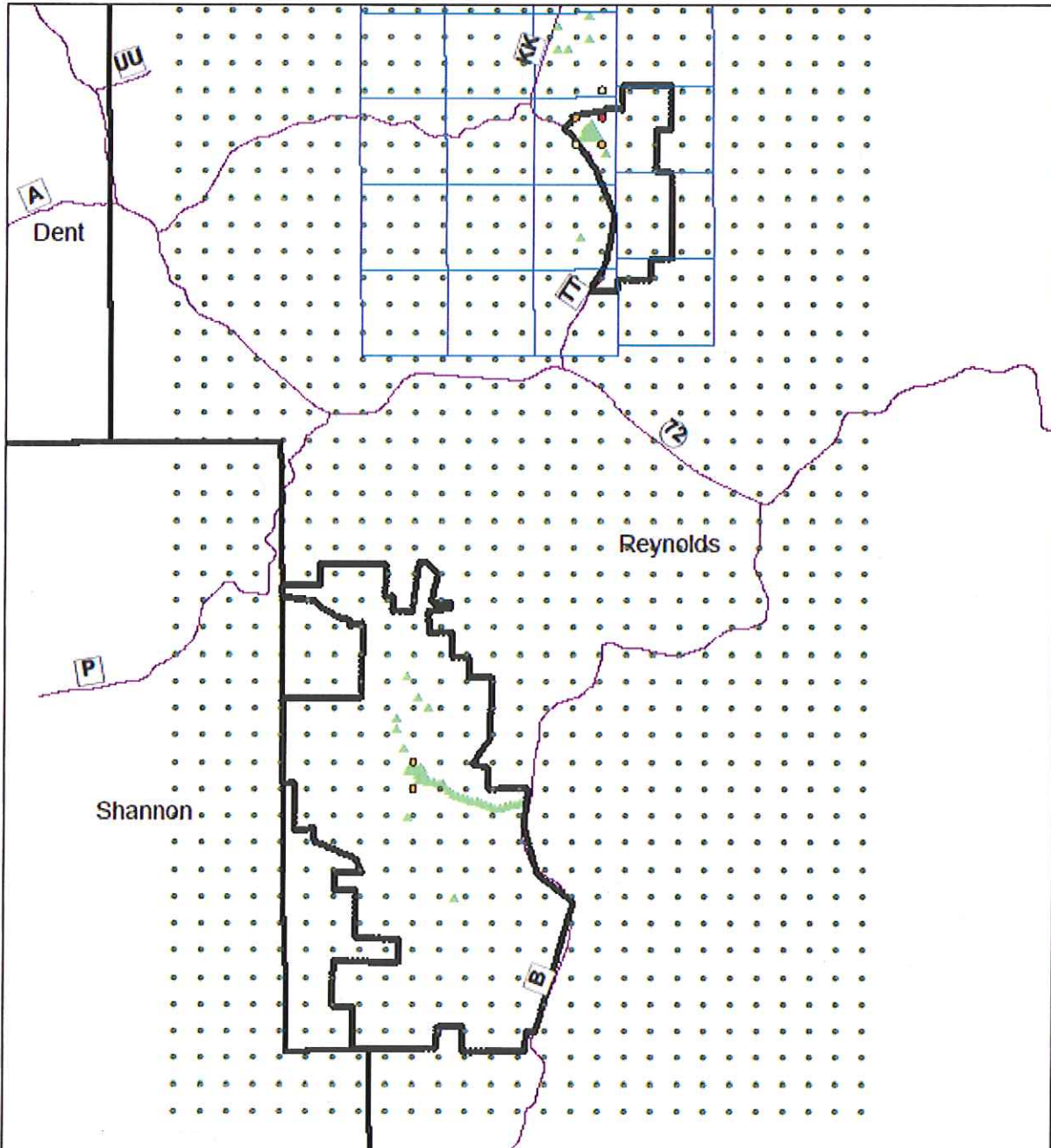


Figure 11. Iron, Dent & Reynolds Counties Modeling Results – North



<p> Recommended Unclassifiable Recommended Non-Attainment Lead NAAQS $\geq 0.155 \mu\text{g}/\text{m}^3$ Missouri Department of Natural Resources Division of Environmental Quality Air Pollution Control Program Prepared by Bern Johnson 24 SEP 09 </p>	<p>Modeled Impacts</p> <ul style="list-style-type: none"> • 0.003 - 0.154 ○ 0.155 - 0.250 ◐ 0.251 - 0.500 ◑ 0.501 - 3.727
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Figure 12. Iron, Dent & Reynolds Counties Modeling Results – South



Recommended Unclassifiable
 Recommended Non-Attainment
Lead NAAQS $\geq 0.155 \mu\text{g}/\text{m}^3$

Modeled Impacts

- 0.003 - 0.154
- 0.155 - 0.250
- ◐ 0.251 - 0.500
- ◑ 0.501 - 3.727

 Missouri Department of Natural Resources
 Division of Environmental Quality
 Air Pollution Control Program
 Prepared by Bern Johnson 24 SEP 09

The Buick/Viburnum Trend modeling indicates that predicted violations of the 2008 NAAQS are within the property boundaries for the mining and milling operations, with the exception of the Buick mine and mill and one receptor north of the Fletcher mine and mill. The model predicts 2008 NAAQS exceedences between the Buick smelter and the Buick mining and milling operations.

MDNR conducted further analysis of the potential for contribution from these sources of lead emissions to one another. The analysis indicates that the Buick smelter, mine and mill (modeled together) contributes 2.5% to the predicted concentrations in the vicinity of the other mine and milling operations (Brushy Creek, Fletcher, and Sweetwater). The analysis also indicates that the other mine and milling operations contribute less than 1% to the predicted concentration for the Buick smelter, mine and mill.

EPA also conducted an independent review of the Buick/Viburnum Trend modeling results and the review is discussed in the Memorandum dated April 30, 2010, previously referenced.⁶ The modeling performed for the Buick/Viburnum used meteorological data obtained from Fort Leonard Wood, which is about 35 miles west of the Buick smelter facility. The upper air data were obtained from the NWS radiosonde site located near Springfield, Missouri. The modeled period extended from August 1, 2005 to December 31, 2007. Fugitive emissions for the mining and milling operations represented a large portion of the source characterization.

2. Emissions and Emissions-Related Data

Evidence of lead emissions sources surrounding a violating monitor are an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county level emission data for lead and population data.

Emissions data that appear on Figure 8 were derived from the 2002 National Air Toxics Assessment, which is the most up-to-date version of the national inventory available to the public when these data were compiled for the designations process in 2009. See <http://www.epa.gov/ttn/atw/natamain/>.

Table 10 shows total emissions of lead (given in TPY) for violating and potentially contributing counties in and around the recommended Iron, Dent and Reynolds Counties nonattainment area and sources emitting greater than 0.5 ton per year of lead according to NATA, cross-referenced with the 2007-2009 state emissions inventory, MoEIS. Based on the 2002 NATA and MoEIS, there are no other sources of lead emissions either within or outside Iron, Dent and Reynolds Counties that are contributing to the recommended nonattainment area for the 2008 Lead NAAQS.

Table 10. Lead Emissions for Iron, Dent and Reynolds Counties

County	Facility in State Recommended Nonattainment Area?	Facility – Total Air Emissions (tons per year)	Facility	Total County Lead Emissions (TPY)
Iron, Dent & Reynolds	Yes	12.4 ¹	Buick secondary Smelter, Mine/Mill	12.5 ¹
Iron	No	0.12 ¹	Glover former primary smelter	12.5 ¹
Dent	Yes	0.018 ²	Buick secondary Smelter	0.018 ²
Reynolds	No	2.9 ²	Fletcher Mine/Mill	5.4 ²
Reynolds	No	1.9 ²	Brushy Creek Mine/Mill	5.4 ²
Reynolds	No	0.6 ²	Sweetwater Mine/Mill	5.4 ²

¹ – National Air Toxics Assessment (NATA) 2002

² – MoEIS, 2008

3. Population Data

Table 11 shows the 2008 population for Iron, Dent and Reynolds Counties in Missouri, which includes the Iron, Dent and Reynolds Counties nonattainment area. These data help assess the extent to which the concentration of human activities in the area and concentration of population-oriented commercial development may indicate emissions-based activity contributing to elevated ambient lead levels. This may include ambient lead contributions from activities that would resuspend lead that has been deposited on the ground or on other surfaces, such as fugitive emissions from the lead concentrate haul routes and lead ore and zinc and copper concentrate handling.

Table 11. Population Data

County	State Recommended Nonattainment?	2008 Population	2008 Population Density (pop/sq mi)	Population Change 2000-2008	Population % Change 2000-2008
Iron Co., Missouri	Yes, partial	9,918	18	-714	-7
Dent Co., Missouri	Yes, partial	15,199	20	265	2
Reynolds Co., Missouri	Yes, partial	6,388	8	-329	-5

Source: U.S. Census Bureau estimates for 2008 (<http://www.census.gov/popest/datasets.html>)

The areas surrounding the Buick secondary smelter and Viburnum Trend are not densely populated; the area is rural. EPA does not believe that the population data provided in the analysis of this factor effects the boundary recommendation.

4. Growth Rates and Patterns

This factor considers population growth for 2000-2008 in the area considered for the nonattainment designation. Table 12 below shows population, and population growth for Iron, Dent and Reynolds Counties in Missouri. All population data is from the U.S. Census Bureau http://www.census.gov/popest/counties/CO-EST2008-popchg2000_2008.html.

Population declines were observed for Iron and Reynolds Counties from 2000 – 2008, while Dent County grew a modest 2%. As stated above, this area of Missouri is rural and so little population growth or decline is typical. EPA has considered the population growth rate for this area and does not believe that it affects the boundary recommendation.

5. Emissions Controls

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 10 above represent emissions levels taking into account any control strategies implemented which previously brought the western Iron County nonattainment area into attainment in 2000, and as a part of the 2004 maintenance plan for the Buick facility.

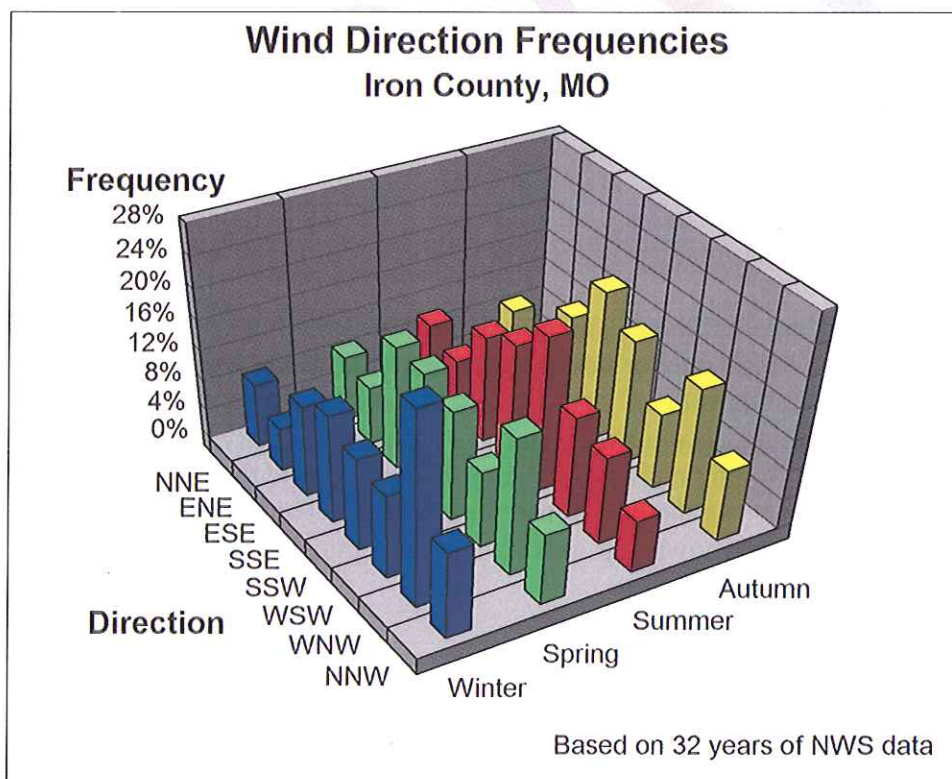
As discussed above, the Glover facility is no longer permitted for pyro-processing operations; the emissions from the facility from 2003 to the present are fugitive emissions from handling lead ore and zinc and copper concentrate.

6. Meteorology

For this factor, EPA considered data from NWS instruments and other meteorological monitoring sites in the area. Wind direction data for the area are depicted in Figure 13 below.

The three-dimensional bar chart above shows the wind frequencies in eight directions for the four seasons. The chart frequencies reflect the directions from which the winds come. Based on Figure 13, it may be concluded that the wind originates predominately from the WNW in the winter months and from the SSW during summer months. These meteorological conditions are similar to that found at Herculaneum (Figure 7), with the exception of the influence of the river valley observed in the on-site monitors at Herculaneum. As discussed above, meteorological data from Fort Leonard Wood which is approximately 35 miles west of Buick smelter facility were used in the lead concentration modeling analysis. There are lead air monitors located both north and south of the Buick smelter facility, and new monitoring locations at Buick, Brushy Creek, Fletcher and Sweetwater mine and milling operations to the south of Buick. The additional new monitors should provide sufficient information to determine NAAQS compliance in areas for which there is little or no historic data. The Iron, Dent and Reynolds Counties nonattainment boundary recommendation is supported by the meteorological data.

Figure 13. Buick/Viburnum Trend Meteorological Data



Source: 1960-1992 Solar and Meteorological Surface Observation Network information issued jointly by the U.S. Department of Commerce: National Climatic Data Center and the U.S. Department of Energy: National Renewable Energy Laboratory

7. Geography/Topography

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of lead over the proposed Iron, Dent and Reynolds Counties nonattainment area.

The Iron, Dent and Reynolds Counties nonattainment area is in a rural portion of southeastern Missouri in the Ozarks region. The area is characteristically wooded and has significant topographic relief. USGS topographic maps indicate as much as 200 feet of relief in this area. Topography most likely influences ambient air transport and weather patterns. Topography and regional weather patterns are accounted for in the dispersion modeling conducted by MDNR; therefore, this factor played an indirect role in establishing the nonattainment boundary in western Iron, Dent and Reynolds Counties.

The Glover facility in eastern Iron County lies in a valley and is located approximately 40 miles to the east of the Buick smelter, mine and mill. Due to the geographic distance of the Glover facility from the nonattainment area, and because the Glover facility lies within a valley, EPA believes that the emissions from lead handling activities at the Glover facility do not contribute to the Iron, Dent and Reynolds Counties nonattainment area.

8. Jurisdictional boundaries

Existing jurisdictional boundaries may be helpful in determining a boundary for purposes of nonattainment designations, and for purposes of carrying out the governmental responsibilities of planning for attainment of the lead NAAQS and implementing control measures. These existing boundaries may include an existing nonattainment or maintenance area boundary, a county or township boundary, a metropolitan area boundary, an air management district, or an urban planning boundary established for coordinating business development or transportation activities.

In the area surrounding the Buick smelter, there is no clear jurisdictional boundary which defines the nonattainment boundary. The Buick smelter lies in Iron County; however, the proposed nonattainment area extends to a small portion of Dent County to the east and Reynolds County to the south. The Buick mine and milling operations extend into Reynolds County, Missouri. The air monitoring data from the Buick South monitor and the modeling indicate that it is appropriate to include portions of Reynolds County in the lead nonattainment area. The nonattainment area therefore must be described officially by township, section and range, consistent with the State's designation recommendation.¹

9. Other Relevant Information

EPA received additional information from the State relevant to establish a nonattainment area boundary for portions of Iron, Dent and Reynolds Counties in Missouri. As discussed in Section 1 above, MDNR submitted the results of a dispersion model analysis in support of its boundary

recommendation. EPA considered this information and conducted an independent analysis in making its proposed boundary recommendation for the Iron, Dent and Reynolds Counties nonattainment area.

Summary

EPA intends to designate portions of Iron, Dent and Reynolds Counties in Missouri which include Doe Run's Buick smelter and Buick mining and milling operation as identified in Figures 8 and 9 as the nonattainment area for the 2008 Lead NAAQS.

Two air quality monitors in Iron County one north and one south of Doe Run's Buick secondary smelter facility show violations of the 2008 Lead NAAQS based on 2007 - 2009 air quality data. Therefore, a nonattainment designation is required for all or some of Iron County. The relevant information, including monitoring and modeling results, supports a partial county designation for Iron County and the expansion of the boundary into portions of Dent and Reynolds Counties. Based on its consideration of all the relevant, available information, as described above, EPA believes that the boundaries described herein encompass the entire area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the 2008 Pb NAAQS. This area will be re-evaluated in the second round of designations, taking into consideration all newly available data and information.

Definition of important terms used in this document:

Designated “unclassifiable” – an area where EPA could not determine if there was a violation of the 2008 Lead NAAQS because there was incomplete air quality data for a three year period either in 2006-2008 or 2007-2009.

Designated “attainment” – an area which EPA has determined that based on the most recent three years of certified air quality data from 2006-2008 or 2007-2009 has no violations of the 2008 Lead NAAQS during 36 consecutive valid three-month rolling site averages; and EPA does not believe that the area contributes to a violation of the 2008 Lead NAAQS in a nearby area.

Designated nonattainment area – an area which EPA has determined, based on a State recommendation and/or on the technical analysis included in this document, has a violation of the 2008 Lead NAAQS for the most recent three consecutive years of quality-assured, certified air quality data. Further, a site does not have to monitor for three full calendar years in order to have a valid violating design value; a site could monitor just three months and still produce a valid (violating) design value.

Prior nonattainment area – an area that is currently designated as nonattainment or maintenance for the 1978 Lead Standard (including both current nonattainment areas and maintenance areas).

Recommended nonattainment area – an area a State or Tribe has recommended to EPA be designated as nonattainment.

Violating monitor – an ambient air monitor whose design value exceeds 0.15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). As described in Appendix R of part 50, a violation can be based on either Pb-TSP or Pb-PM10 data and only three months of data are necessary to produce a valid violating design value.

1978 Lead NAAQS – $1.5 \mu\text{g}/\text{m}^3$, National Ambient Air Quality Standard for lead promulgated in 1978. Based on Pb-TSP indicator and averaged over a calendar quarter.

2008 Lead NAAQS - $0.15 \mu\text{g}/\text{m}^3$, National Ambient Air Quality Standard for lead promulgated in 2008. Based on Pb-TSP indicator and a three-month rolling average. Pb-PM10 data may be used in limited instances, including to show nonattainment.