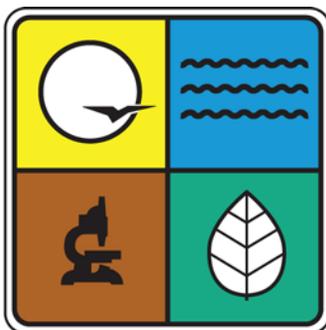


Lead Designation and Boundary Recommendation

**Adopted by the
Missouri Air Conservation Commission
December 3, 2009**



MISSOURI DEPARTMENT OF NATURAL RESOURCES

**Division of Environmental Quality
Air Pollution Control Program
P.O. Box 176
1659 East Elm Street
Jefferson City, Missouri 65102
Telephone (573) 751-4817**

This page intentionally left blank.

Table of Contents

LIST OF FIGURES	IV
INTRODUCTION	1
SUMMARY OF RECOMMENDATION	1
BUICK/VIBURNUM TREND NONATTAINMENT AREA	1
HERCULANEUM NONATTAINMENT AREA	1
BUICK/VIBURNUM TREND UNCLASSIFIABLE AREA	2
HERCULANEUM UNCLASSIFIABLE AREA	2
OLD LEAD BELT UNCLASSIFIABLE AREA	2
TRI-STATE UNCLASSIFIABLE AREA	2
BACKGROUND	5
FEDERAL AREA DESIGNATIONS	5
CRITERIA FOR DESIGNATION	6
PROCESS FOR DEVELOPING RECOMMENDATION	7
BOUNDARY CONSIDERATIONS – TECHNICAL DISCUSSION	7
HERCULANEUM PRIMARY SMELTER.....	7
BUICK SECONDARY SMELTER	10

List of Figures

FIGURE 1: RECOMMENDED HERCULANEUM NONATTAINMENT AND UNCLASSIFIABLE AREAS	3
FIGURE 2: RECOMMENDED BUICK/VIBURNUM TREND NONATTAINMENT AND UNCLASSIFIABLE AREAS	4
FIGURE 3: RECOMMENDED HERCULANEUM NONATTAINMENT AND UNCLASSIFIABLE AREA LEGAL DESCRIPTIONS	9
FIGURE 4: RECOMMENDED BUICK/VIBURNUM NONATTAINMENT AREA LEGAL DESCRIPTIONS	11
FIGURE 5: RECOMMENDED BUICK/VIBURNUM UNCLASSIFIABLE AREA LEGAL DESCRIPTIONS.....	12

Introduction

The purpose of this document is to summarize the analysis used to determine the recommendation for designation of geographic areas in the state as nonattainment for lead. The U.S. Environmental Protection Agency (EPA) 2008 revision to the National Ambient Air Quality Standard (NAAQS) for lead establishes 0.15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) as the primary and secondary standard. In general, the analysis is based on data collected from the years 2006-2008 and the EPA guidance for developing the lead designation recommendations included in the final lead NAAQS rule published in the November 12, 2008, *Federal Register*. The Missouri Department of Natural Resources' (Department) Air Pollution Control Program developed the *Technical Support Document for Recommendation of Nonattainment Boundaries in Missouri for the 2008 Lead National Ambient Air Quality Standard* to assemble the information necessary to make the recommendations and to address each EPA criterion in detail.

Summary of Recommendation

The Department developed this recommendation based on a review of the technical information as required by EPA guidance. Based on the 2006-2008 monitoring data, two distinct areas in Missouri violate the 2008 lead NAAQS: Buick/Viburnum Trend in Dent, Iron, and Reynolds Counties and Herculaneum in Jefferson County (Figures 1 and 2). The recommended boundaries for the lead nonattainment areas in Missouri include the following:

Buick/Viburnum Trend Nonattainment Area

Iron County: T34N, R1W, sec. 6-7, 18-19, 30-32 and T34N, R2W, sec. 1-3, 10-15, 22-27, 34-36

Dent County: T34N, R2W, sec. 4, 9, 16, 21, 28, 33

Reynolds County: T33N, R1W, sec. 5-7 and T33N, R2W, sec. 1-3, 10-12

Herculaneum Nonattainment Area

Jefferson County: The Herculaneum city limits (as the city limits are defined when this document is adopted on December 3, 2009)

The Department recommends the area around a formerly active lead smelter in Glover, located in Iron County, for designation as attainment for the 2008 standard, based on current monitoring data. The Doe Run Company ceased smelter operations at the Glover facility in December 2003 and it currently does not have an operating permit to use the pyro-processing equipment for lead smelting. Arcadia and Liberty Townships surrounding the facility were designated as attainment for the 1978 lead standard in 2003 and the area is currently under a maintenance plan for the 1978 lead standard. Monitoring in Arcadia Township was discontinued in 2004, following the suspension of smelter operations; however, the last two calendar quarters recorded show compliance with the 2008 lead standard. Therefore, the Department recommends Glover as attainment designation, at this time. The Department has proposed that a Department-operated monitor should be added to the site. Should the monitors record any violations of the standard or

Doe Run change the nature of operations at Glover in the future, the Department will have to reevaluate the area and it may have to be designated as nonattainment.

The monitor that is located in St. Louis County is currently in attainment for the 2008 standard. The Department recommends that St. Louis County be designated as attainment based on current monitoring data; however, once the monitoring plan is developed for nonsource-oriented monitors, this will be further evaluated.

The Department recommends that other areas of the state with lead emissions from former and current lead smelting, mining, and milling operations be designation as unclassifiable since no current monitoring data is available. The counties designated as unclassifiable include:

Buick/Viburnum Trend Unclassifiable Area

Reynolds County: T32N, R1W, sec. 6-7, 18-19, 30
T32N, R2W, sec.1-3, 10-15, 22-27
T33N, R1W, sec.18-19, 30-31
T33N, R2W, sec. 13-15, 22-27, 34-36

Herculaneum Unclassifiable Area

Jefferson County: T41N, R5E, sec. 12
T41N, R6E, sec. 18 and 32
Land Grants 266, 420, and 932;
and portions of T41N, R6E, sec. 17, 19, 31 and
Land Grants 1986 and 2977 outside the city limits of Herculaneum
(as the city limits are defined as of December 3, 2009).

Old Lead Belt Unclassifiable Area

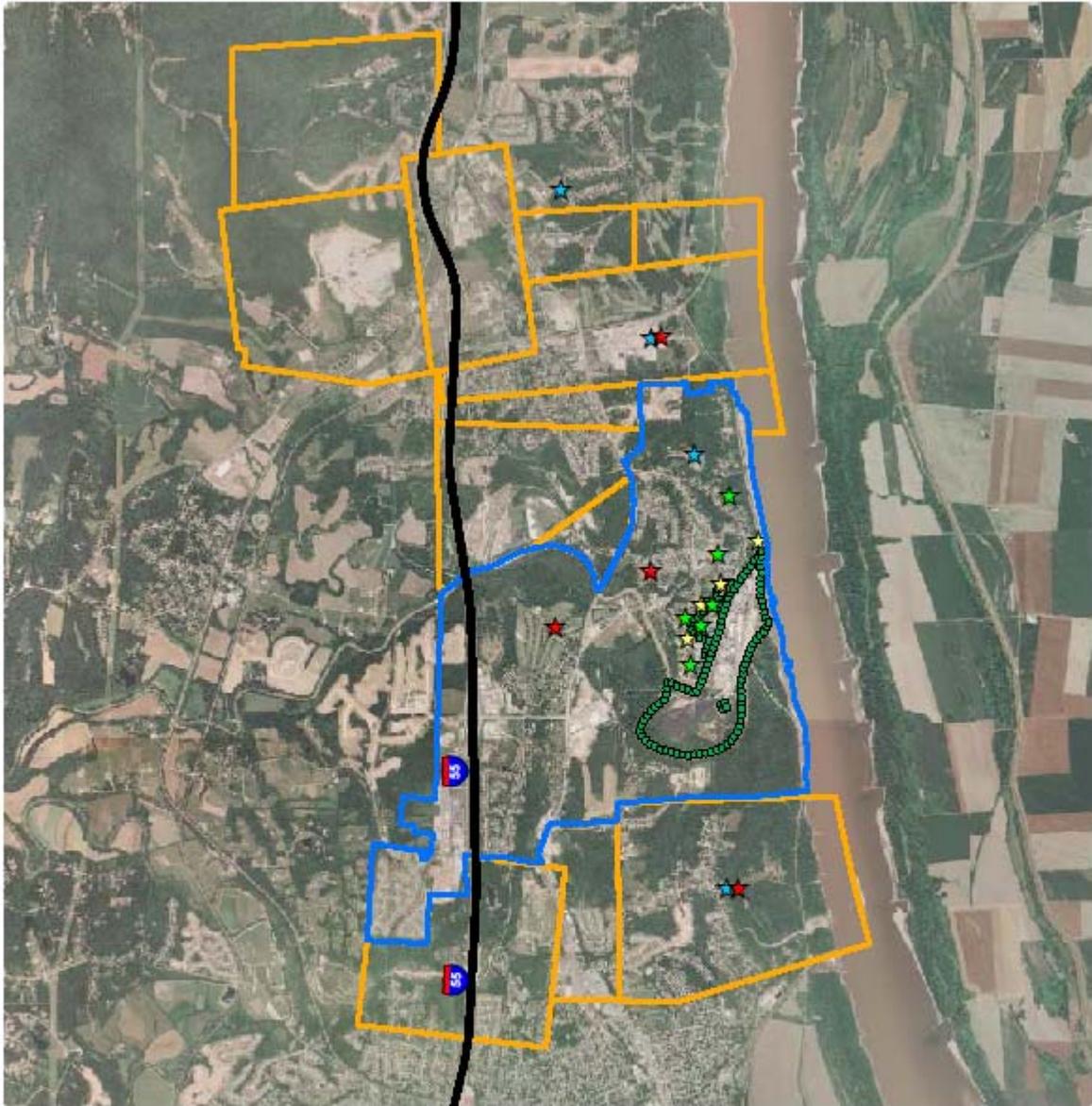
St. Francois County: Perry, Randolph, and St. Francois Townships

Tri-State Unclassifiable Area

Jasper County: Duval, Galena, Jackson, Jasper, Joplin, Marion, Mineral, Preston, and
Twin Groves Townships in Jasper County

Newton: Shoal Creek Township

The remaining countries in Missouri are recommended for designation as attainment/unclassifiable.



Current & Recommended Non-Attainment Area - Herculaneum City Limits
 Recommended Unclassifiable Area

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 6 NOV 09

★ Active
★ Discontinued
★ proposed
★ to be discontinued



Figure 1: Recommended Herculaneum Nonattainment and Unclassifiable Areas

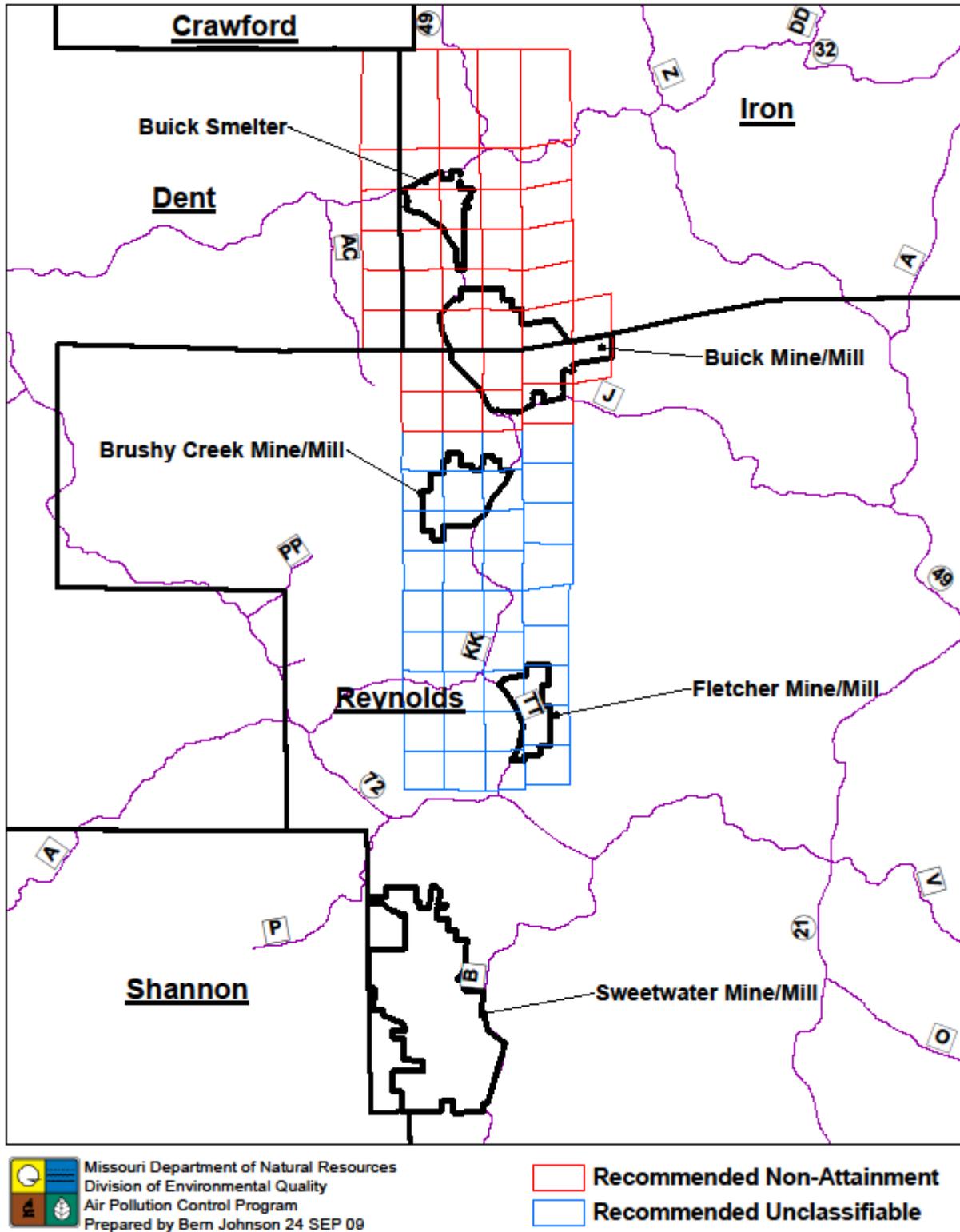


Figure 2: Recommended Buick/Viburnum Trend Nonattainment and Unclassifiable Areas

Background

On October 15, 2008, EPA promulgated the revised lead NAAQS, which obligated the State of Missouri to designate the attainment status of all areas of the state. The final rule was published in the *Federal Register* on November 12, 2008 (73 FR 66964) and became effective January 12, 2009. EPA revised the NAAQS by changing the level of the primary and secondary standards from $1.5 \mu\text{g}/\text{m}^3$ to $0.15\mu\text{g}/\text{m}^3$. EPA changed the calculation method for the averaging time from a calendar quarter average to a stricter, “rolling” three-month period.

EPA based the 2008 standard on considerable scientific evidence about lead and health, which has dramatically expanded since EPA issued the initial standard of $1.5 \mu\text{g}/\text{m}^3$ in 1978. More than 6,000 new studies on lead health effects, environmental effects and lead in the air have been published since 1990. Evidence from health studies shows that adverse effects occur at much lower levels of lead in blood than previously thought. Exposure to lead pollution is associated with a broad range of health effects, including damage to the central nervous system, cardiovascular system, kidneys, immune system, and red blood cells. The focus of the 2008 standard is to be protective of young children who are most susceptible to the effects of lead exposure.

Sources of lead emissions include gasoline for piston-engine aircraft, metal industries (lead and copper smelting, iron and steel foundries, metal mining), manufacturing industries (glass and cement), waste incinerators, and boilers (utility, industrial, commercial, and institutional). Missouri has led all other states in lead production for over 70 years. Missouri still has active lead mines, a primary lead smelter, and secondary lead smelters.

The Clean Air Act (CAA) allows each state to recommend initial designations of the attainment status for all areas of the state. Specifically, Section 107(d)(1) of the CAA allows each state an opportunity to recommend attainment/unclassifiable and nonattainment areas including appropriate boundaries. EPA can accept the recommendation or make modifications, as it deems necessary.

The deadline for submittal of Missouri’s recommendation was October 15, 2009. The Department is submitting its recommendations in December 2009 because it expanded its public outreach once it was determined additional communities would be impacted by the recommendations. The EPA’s Region VII office supports the additional public outreach and resulting later submittal. The deadline for EPA to finalize the boundary designation is January 1, 2011, for areas with existing monitoring networks and sufficient data and January 1, 2012, for areas without such data. States will have to submit their lead State Implementation Plans (SIPs) to EPA 18 months following the designation date (July 2012 or July 2013). Areas must reach attainment five years after the designations are finalized (January 2016 or January 2017).

Federal Area Designations

Nonattainment: any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant,

Attainment: any area that meets the national primary or secondary ambient air quality standard for the pollutant, or

Unclassifiable: any area that cannot be classified based on available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

Criteria for Designation

The guidance used to support this designation comes from the final lead NAAQS rule, published in the *Federal Register* on November 12, 2008 (73 FR 66964). The 2008 standard for airborne lead is $0.15\mu\text{g}/\text{m}^3$, measured as total suspended particulate matter (TSP). The averaging time to determine an exceedance is calculated using rolling, three-month periods, evaluated over a three-year period. The Department's Environmental Services Program (ESP) currently operates samplers at five sites in Herculaneum and one in St. Louis County. Doe Run operates samplers at nine sites in Herculaneum, two sites near the Buick smelter, and two sites near the Glover smelter.

In the guidance provided in the lead rule, EPA recommends that the perimeter of the respective county serve as the presumptive boundary for each nonattainment area. To add or remove geography from the presumptive boundary, EPA's guidance requires each state to address the following factors in the recommended nonattainment area versus excluded areas:

- Emissions
- Air quality
- Population density and degree of urbanization including commercial development
- Expected growth (including extent, pattern and rate of growth)
- Meteorology (weather/transport patterns)
- Geography/topography
- Jurisdictional boundaries
- Level of control of emission sources

Analysis of these factors may suggest nonattainment boundaries that are either larger or smaller than the county boundaries. EPA guidance further states that a demonstration supporting the designation of boundaries that are less than the full county would be required to show both the violation(s) are not occurring in the excluded portions of the county and that the excluded portions are not source areas that contribute to the observed violations. In addition to using the factor analyses listed above to recommend lead nonattainment boundaries, a state can choose using any one, or a combination of the following techniques:

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

Process for Developing Recommendation

On July 21, 2009, the Department presented the preliminary nonattainment recommendations at the bimonthly meeting of the Herculaneum Lead Smelter Community Advisory Group. The Department held a second public outreach meeting for the communities of Crystal City, Festus, Herculaneum, and Pevely on September 16, 2009, at the Herculaneum High School. The Department developed a draft recommendation for public comment and review. The draft document was made available to the public 30 days prior to the Department presenting the draft designation recommendation to the Missouri Conservation Commission (MACC) at a public hearing on October 29, 2009. After consideration of the comments received, the Department is presenting this final statewide recommendation for adoption by the commission. Upon adoption, the Governor or his designee will send the recommendation to EPA Region VII. After this submittal, EPA will consider all states' recommendations and provide an additional opportunity for comment on the final designation status of all areas. The Department is, and will remain, committed to keeping stakeholders involved throughout the remaining designation process and subsequent State Implementation Plan development process.

Boundary Considerations – Technical Discussion

Section 107(d)(1)(A) of the Clean Air Act defines a nonattainment area as any area that does not meet or that contributes to nearby areas not meeting the ambient air quality standard. The relevant EPA guidance allows states to consider, at a minimum, the boundary criteria when establishing boundaries. The implementation of control strategies that will eventually be used in the SIP process for these areas is a distinct and separate process and is not a primary consideration in this boundary evaluation.

In order to determine which areas of the state should be designated as nonattainment for lead, the Department examined areas that have existing, violating monitors.

Herculaneum Primary Smelter

The Doe Run Company operates the Missouri's only active primary smelter in Herculaneum, Missouri, located southwest of St. Louis in Jefferson County. Herculaneum is the only area in the state that is nonattainment for the 1978 lead standard. Airborne lead monitoring is conducted in Herculaneum, near the smelter. The Department's ESP operates samplers at the following locations:

- Bluff
- Broad Street
- Circle Street
- Dunklin High School
- Main Street

The Doe Run Company operates samplers at the following locations:

- Bluff
- Broad Street
- Church Street (two collocated samplers)
- Circle Street (discontinued at the end of September 2008)
- Dunklin High School (two collocated samplers through March 2008)
- Main Street/City Hall
- Mott Street
- Sherman Drive
- South Cross Street
- North Cross Street

According to 2006-2008 data, none of the existing samplers meet the 2008 lead standard. All of the samplers are located within the city limits of Herculaneum.

Conclusion: Many factors clearly show that the City of Herculaneum should be included in the nonattainment area. The primary consideration is the fact that the ambient air monitoring in the city shows violations of the 2008 lead NAAQS. The Department used the monitoring data with weather data and modeling analysis to estimate the full extent of the nonattainment area.

The lead rule recommends that the perimeter of the respective county serve as the presumptive boundary for each nonattainment area; however, since it is clear that this nonattainment area is the result of a single source (the Doe Run primary smelter) and airborne lead does not transport over distance due to the density of the lead particles, it makes sense to designate a smaller area. There is insufficient current monitoring data at distance from the smelter and a great deal of uncertainty associated with the EPA-recommended monitoring data interpolation and dispersion modeling techniques. This leads to the Department's recommendation of nonattainment to be limited to the city limits of Herculaneum, which is identical to the 1978 nonattainment boundary. The Department is using the county-township-range-sections legal descriptions to define portions of Crystal City, Festus, and Pevely as unclassifiable with respect to the 2008 standard (Figure 3). The Department will re-examine these areas after 2010 (sampling begins at new Herculaneum monitoring sites in January 2010) to propose a recommendation of attainment or nonattainment for the areas recommended as unclassifiable.

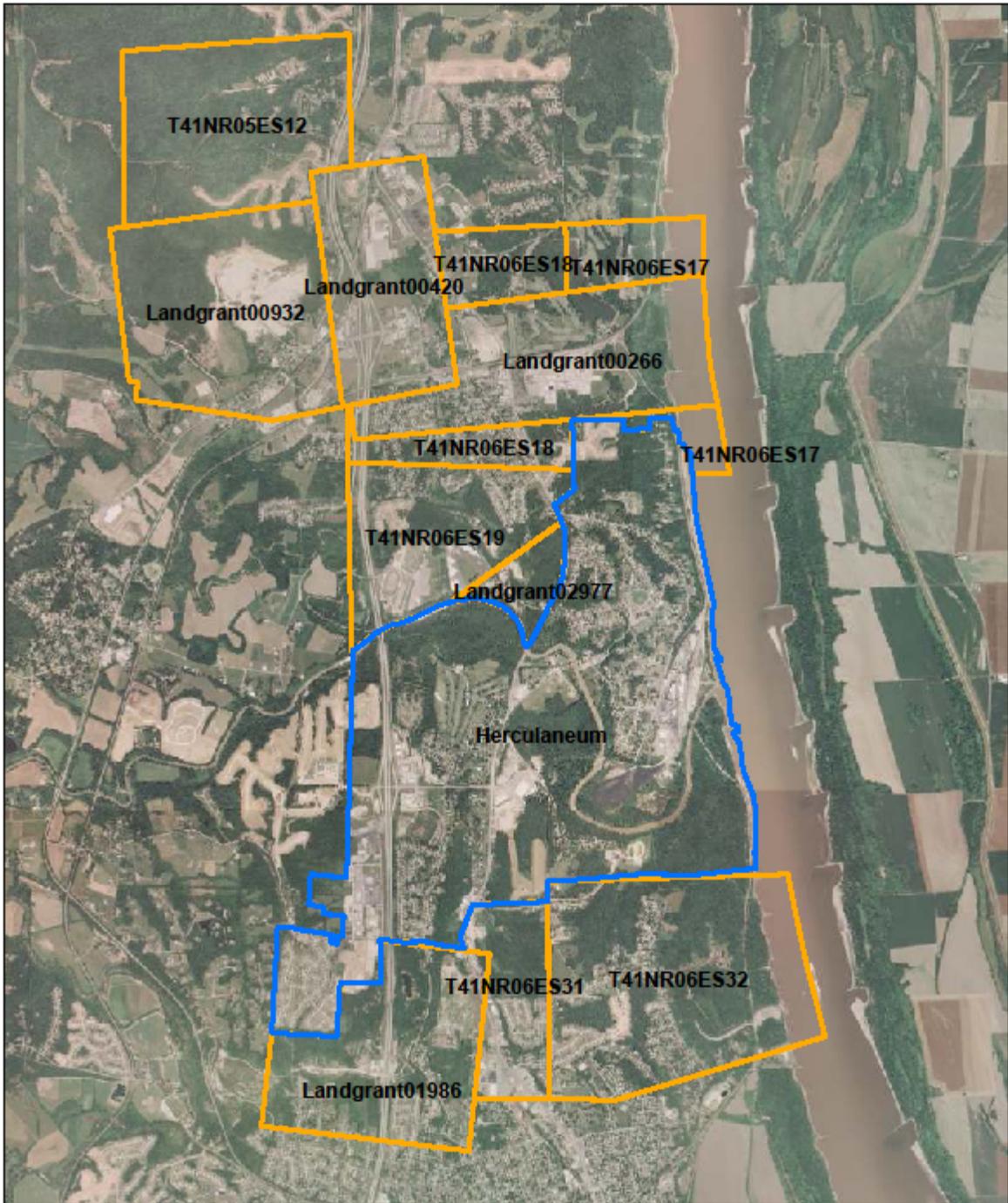


Figure 3: Recommended Herculaneum Nonattainment and Unclassifiable Area Legal Descriptions

Buick Secondary Smelter

Doe Run operates its resource recycling division north of the Buick mine and mill, near Boss, Missouri, located in the southwest corner of Iron County. The facility is a secondary smelter that primarily recycles lead acid batteries. Airborne lead monitoring is conducted near the smelter. The Department's ESP no longer operates samplers near the facility. The Doe Run Company operates samplers at the following locations:

- Buick North (1.2 miles north of smelter)
- Buick South (0.8 mile south of smelter)

Both monitors had complied with the 1978 lead standard of $1.5 \mu\text{g}/\text{m}^3$ until a recent upset that caused a violation of that standard during the fourth calendar quarter of 2008.

According to 2006-2008 data, none of the existing samplers meet the 2008 lead standard. Both monitor sites are located on Doe Run property, which makes it difficult to determine the extent of the nonattainment boundary. The current maintenance area for the Buick smelter is Dent Township in Iron County.

Conclusion: Since the current monitors are violating the 2008 standard and are located on the Doe Run property, it is difficult to make a determination as to how far to extend the nonattainment boundary. The Department used the monitoring data with weather data and modeling analysis to estimate the full extent of the nonattainment area.

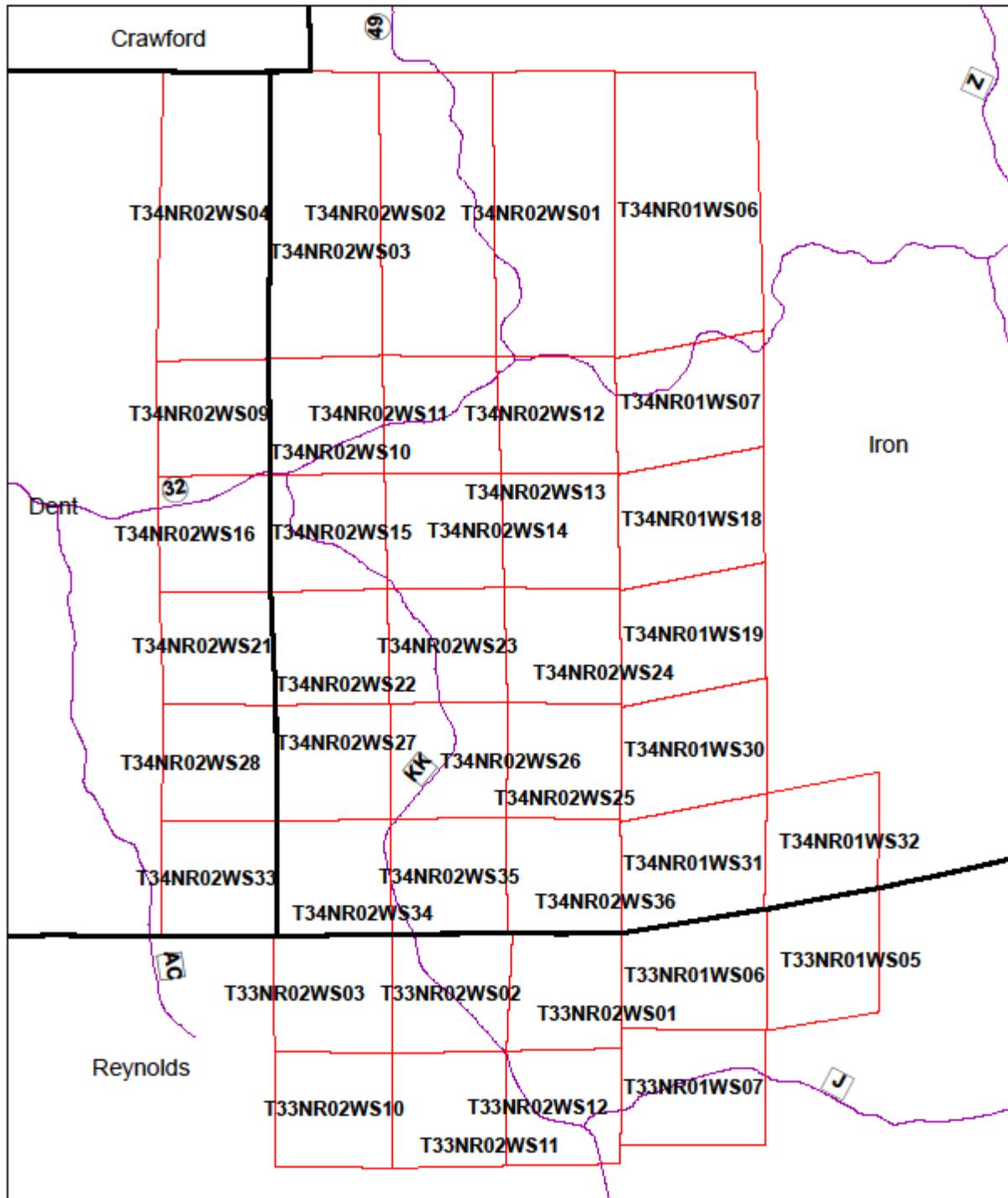
As with Herculaneum, the Department recommends narrowing the nonattainment boundary from the presumptive boundary of the county perimeter since we know the main sources that cause the area to be nonattainment for the 2008 lead standard. This designation is especially complicated by the fact that Iron County has an unusual shape, one area (Glover) where the monitors meet the 2008 standard, and another area (Buick) that does not meet the 2008 standard. The nonattainment boundary determination is further complicated by the fact that the smelter is located in the Viburnum Trend area, where Doe Run operates six underground lead mines, four of which also have mills on site. The smelter could impact the level of lead in the ambient air around these facilities and the mine/mill complexes could affect the levels at the smelter. It is difficult to determine the impact of these sources on one another since ambient air lead monitoring has not been done in the past in the vicinity of the mine/mill sites. Doe Run has recently established a monitor near the Brushy Creek facility for the purpose of air quality modeling results, not as an ambient monitor.

The boundary for the existing maintenance area for the 1978 lead standard is Dent Township in Iron County. Using the monitoring and modeling data, the Department recommends that the following areas be included in the nonattainment area (Figures 4 and 5):

Iron County: T34N, R1W, sec. 6-7, 18-19, 30-32 and T34N, R2W, sec. 1-3, 10-15, 22-27, 34-36

Dent County: T34N, R2W, sec. 4, 9, 16, 21, 28, 33

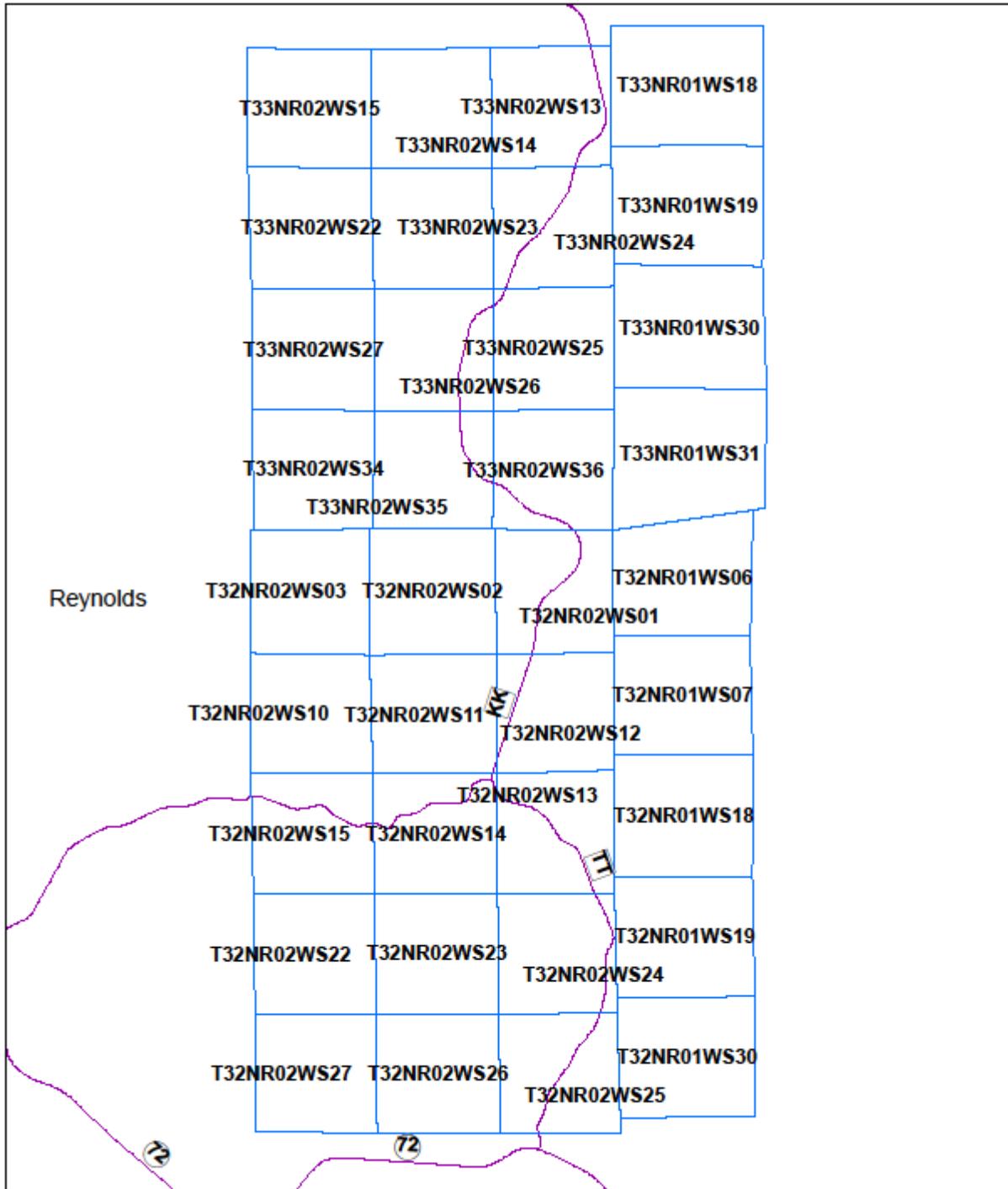
Reynolds County: T33N, R1W, sec. 5-7 and T33N, R2W, sec. 1-3, 11-12




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

 **Recommended Non-Attainment**

Figure 4: Recommended Buick/Viburnum Nonattainment Area Legal Descriptions




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

 Recommended Unclassifiable

Figure 5: Recommended Buick/Viburnum Unclassifiable Area Legal Descriptions