

State Implementation Plan Revision for the  
Implementation, Maintenance, and Enforcement of the  
2008 Lead National Ambient Air Quality Standard

*Attainment Demonstration*



*Our Vision – Healthy Kansans living in safe and sustainable environments*

Department of Health and Environment  
Division of Environment  
Bureau of Air  
(785) 296-6024

July 2014

This page intentionally left blank

# TABLE OF CONTENTS

INTRODUCTION .....	1
EMISSIONS INVENTORY .....	5
MONITORING AND AMBIENT AIR QUALITY DATA .....	7
Source-oriented Monitoring .....	7
Lead Monitoring Network .....	8
INTERSTATE TRANSPORT .....	9
ATTAINMENT DEMONSTRATION MODELING.....	9
AERMOD Modeling System .....	9
Modeling Analysis .....	10
Background Lead Concentrations .....	10
Modeling Results .....	10
CONTROL STRATEGY.....	12
RACM/RACT .....	12
Point Sources Control Activities .....	13
BALLFUG Source .....	15
Roadways .....	16
Current Projects Completion Summary .....	17
REASONABLE FURTHER PROGRESS (RFP) .....	17
Emission Reduction Projects .....	18
RFP Project Completion Timeline .....	19
CONTINGENCY MEASURES.....	20
Contingency Triggers and Corrective Actions .....	20
OUTREACH .....	21
Public Participation .....	22
CONCLUSION .....	23

## FIGURES

Figure 1	Saline County Lead Nonattainment Area Boundary .....	4
Figure 2	Salina Reported Facility Stack Emissions 2007 – 2013 .....	6
Figure 3	Salina, Kansas Lead Source Monitoring Site .....	7
Figure 4	Salina Lead Monitor Average Values .....	8
Figure 5	Contour Map of Lead Concentration .....	11
Figure 6	Decline of Annual Average Lead Monitor Values .....	12

## TABLES

Table 1	Applicable Clean Air Act Requirements for Lead Nonattainment .....	3
Table 2	Summary of Predicted Impacts at Maximum and Sensitive Receptors .....	10
Table 3	Oxide Mill Replacement Completion .....	13
Table 4	Facility Baghouse Project Completion .....	13
Table 5	Point Source Control Stack Tests .....	14
Table 6	Point Source Control Emission Rates .....	14
Table 7	Ball Mill Total Enclosure Standards .....	16
Table 8	Current Improvement Projects Completion .....	17
Table 9	Emission Reduction Projects .....	18
Table 10	Reasonable Further Progress Project Completion .....	19
Table 11	Contingency Measures Completion .....	20

## APPENDICES

Appendix A	Environ Air Dispersion Modeling Report for SIP Attainment Demonstration
Appendix B	RACM/RACT Improvement Projects (Control Strategy and RFP)
Appendix C	Federally Enforceable Construction Permit (RFP)
Appendix D	Federally Required Public Participation Documents
Appendix E	ISO Certification Document
Appendix F	Exide Technologies' Contingency Measures Compliance Plan Report Hi-Volume Air Inspection Form

## INTRODUCTION

Lead is one of the six criteria air pollutants identified as particularly harmful to humans and the environment. National Ambient Air Quality Standards (NAAQS) were developed for these six pollutants to use as measurements of air quality. The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (U.S. EPA) to set primary standards at a level judged to be “requisite to protect the public health with an adequate margin of safety,” and to establish secondary standards requisite to protect public welfare from “any known or anticipated effects associated with the pollutant in the ambient air,” including effects on crops, vegetation, wildlife, buildings and national monuments, and visibility. Therefore, National Ambient Air Quality Standards (NAAQS) were established to measure air quality in regard to Ozone (O<sub>3</sub>), Nitrogen Dioxide (NO<sub>2</sub>), Sulfur Dioxide (SO<sub>2</sub>), Lead (Pb), Particulate Matter (PM), and Carbon Monoxide (CO). Both primary and secondary standards are updated as necessary.

On October 15, 2008, the U.S. EPA promulgated a revision to the 2008 National Ambient Air Quality Standard (NAAQS) for lead then published a final rule in the *Federal Register* on November 12, 2008. ([73 FR 66964](#)) This revision establishes 0.15 micrograms per cubic meter (µg/m<sup>3</sup>), measured as a rolling three-month average for the primary and secondary lead standard; an order of magnitude lower than the previous standard of 1.5 µg/m<sup>3</sup> set in 1978.

In accordance with the federal Clean Air Act (CAA), the governor of Kansas submitted a recommendation to EPA on June 6, 2011 that a portion of Saline County surrounding the Exide Technologies (Exide) lead acid battery manufacturing plant in Salina, Kansas be designated as a nonattainment area for lead. This recommendation was based on 2008 through 2010 monitoring data, air dispersion modeling, and analysis of additional factors as prescribed by the EPA regulations and guidance. On November 8, 2011, the EPA designated part of the city of Salina and Saline County, Kansas as nonattainment for the 2008 Lead NAAQS. ([76 FR 72097](#))

The main purpose of this SIP revision is to address requirements described in the Clean Air Act, Section 172(c) that pertain to the Saline County, Kansas nonattainment area. This SIP revision establishes reasonably available control technology (RACT), reasonably available control measures (RACM), reasonable further progress (RFP), and emission limitations as required to reduce impacts of lead emissions in the air. Historic and current air quality data included in this report illustrate progress made since the national lead standard revision went into effect in January 2009.

Kansas respectfully submits this information with described authority to enforce the compliance measures that Exide Technologies agrees to incorporate. And finally, KDHE takes this action in accordance with the Clean Air Act (CAA or Act) and EPA’s guidance related to lead standard attainment planning.

### Clean Air Act Requirements

Section 191(a) of the federal CAA requires states with lead nonattainment areas to submit a state implementation plan (SIP) revision to EPA that demonstrates attainment strategies within five years following nonattainment designation. Kansas was identified in the second round of nonattainment designations, effective December 2011, and provides this SIP revision to demonstrate Saline County lead attainment to EPA. This plan addresses background lead concentration in the air, the impact of emissions from Exide operations, and the impact of other lead emitting facilities within the designated nonattainment area.

Control strategies and contingency measures identified for this proposed revision are federally enforceable through permits issued by the KDHE Bureau of Air (BOA). Scheduled issuance of Construction Permit C-12206 (Appendix C) following the required 30-day public notice period for this SIP revision supports attainment of the 2008 Lead NAAQS by December 31, 2016.

Kansas has a long standing and fully implemented New Source Review (NSR) permitting program. CAA Section 172(c)(5) provisions are addressed in K.A.R. 28-19-300 et seq. K.A.R. 28-19-301(d) *Construction permits and approvals; application and issuance* specifically addresses attainment provision as: “No construction permit or approval shall be issued if the department determines that the air contaminant emissions from the source will interfere with the attainment or maintenance of any ambient air quality standard that has been established under the provisions of the federal clean air act, as amended, or under the provisions of state law.”

Transportation conformity is required under CAA Section 176(c) (42 U.S.C. 7506(c)) to ensure that federally supported highway and transit project activities are consistent with the purpose of the SIP. In light of lead additive elimination from gasoline in the United States (1980s), transportation conformity does not apply to the 2008 Lead NAAQS.

### State Implementation Plan Approval

Section 110 of the CAA defines general SIP requirements and Part D contains requirements applicable to Subpart 1, nonattainment areas. Section 110 requirements were addressed under Kansas’ 2008 Lead NAAQS Infrastructure SIP, dated October 2011.<sup>1</sup>

This attainment demonstration document addresses Part D requirements set forth in section 172 of the CAA for the partial Saline County nonattainment area.<sup>2</sup> The following sections of this document address CAA Section 172(c) requirements as well as portions of Sections 110 as referenced in Table 1, below.<sup>3</sup>

---

<sup>1</sup> The 2008 Lead NAAQS SIP Revision (Infrastructure SIP) is available on KDHE’s website: <http://www.kdheks.gov/bar/air-monitor/lead/lead.html>

<sup>2</sup> Additional specific plan requirements for lead nonattainment areas are outlined in 40 CFR 51.117.

<sup>3</sup> The requirements of Section 172(c)(7) (compliance with Section 110(a)(2)) were addressed as part of Kansas’ 2008 Lead NAAQS Infrastructure SIP submittal, some of which are addressed, again, in this attainment demonstration submittal.

**Table 1: Applicable CAA Requirements for Lead Nonattainment**

<b>Applicable CAA Requirements for Lead Nonattainment</b>		<b>Page(s)</b>
<ul style="list-style-type: none"> <li>▪ Nonattainment areas (Nonattainment plan provisions in general)</li> </ul>	§ 172(c)	1-3
<ul style="list-style-type: none"> <li>▪ Transportation Conformity</li> </ul>	§ 176(c)	2
<ul style="list-style-type: none"> <li>▪ Emissions Inventory</li> </ul>	§ 172(c)(3)	5-6
<ul style="list-style-type: none"> <li>▪ Monitoring and ambient air quality data</li> </ul>	§ 110(a)(2)(B)	7-8
<ul style="list-style-type: none"> <li>▪ Interstate Transport</li> </ul>	§ 172(c)(7) § 110(a)(2)(D)	9
<ul style="list-style-type: none"> <li>▪ Reasonably Available Control Measures (RACM)</li> <li>▪ Reasonably Available Control Technology (RACT)</li> </ul>	§ 172(c)(1)	1, 12-13
<ul style="list-style-type: none"> <li>▪ Enforceable emission limitations</li> <li>▪ Control measures</li> <li>▪ Compliance schedules and timetables</li> </ul>	§ 172(c)(6) and § 110(a)(2)(A)	13-17
<ul style="list-style-type: none"> <li>▪ Reasonable further progress requirement (RFP)</li> </ul>	§ 172(c)(2)	1, 17-19
<ul style="list-style-type: none"> <li>▪ Contingency Measures</li> </ul>	§ 172(c)(9)	2, 20-21 Appendix F
<ul style="list-style-type: none"> <li>▪ Federally Enforceable Construction Permit C#12206</li> </ul>		Appendix C
<ul style="list-style-type: none"> <li>▪ Public Participation/Outreach</li> </ul>	§ 110(a)(2) 40 CFR 51.102	21-23 Appendix D

## Background

Lead is a naturally occurring, toxic metal found in rocks and soil. Lead particles are sometimes emitted from industrial processes and may be present in manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Since the phase-out of leaded gasoline, EPA's lead air quality monitoring strategy generally focuses on areas surrounding industrial sources that process metals, particularly primary and secondary lead smelters.

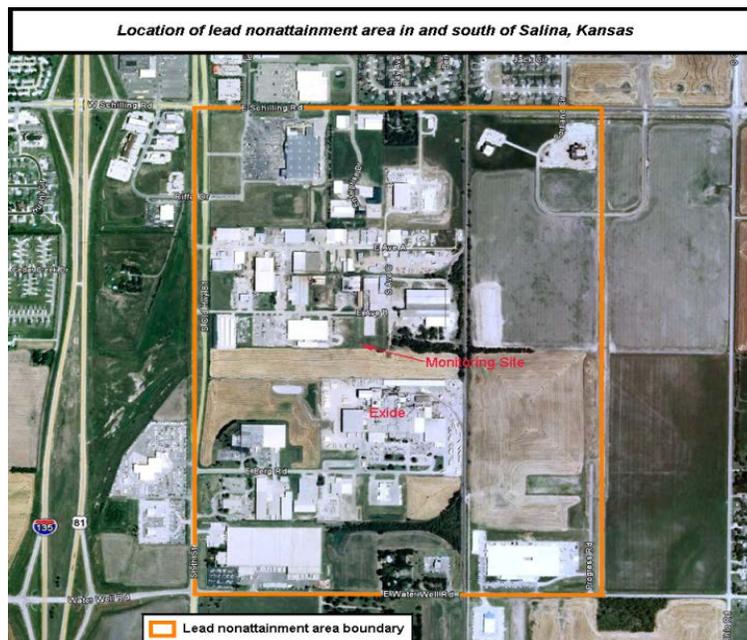
## Health Effects

People can be exposed to lead by breathing air, drinking water, eating foods, or swallowing dust or dirt that contains lead. Lead affects children more seriously than adults. Some of the more common health effects of lead exposure in children include: irritability, anemia, loss of appetite, hyperactivity and learning disabilities. Common health effects of lead exposure in adults include: fatigue, nausea, anemia, reproductive problems and impaired concentration. The Centers for Disease Control and Prevention recommends that protective actions take place when a child's blood lead level is greater than or equal to 5 µg/dL or a blood lead level of 25µg/dL or greater is found in an adult.

## Site Description

Exide owns and operates a lead-acid battery and lead oxide manufacturing facility at 413 East Berg Street in Salina, Kansas (Saline County) where lead acid batteries were historically manufactured for automobile, truck, and marine applications. Current production includes lead battery manufacturing for a wide variety of applications. Figure 1 defines the lead nonattainment area boundary surrounding Exide property with the initial monitor site.

**Figure 1: Saline County Lead Nonattainment Area Boundary**



The Exide facility properties occupy approximately 46 acres centered within the total nonattainment area that spans 475 acres of Saline County, situated 1.6 kilometers north to south and 1.2 kilometers east to west.

Exide's personnel utilize an environmental management system (EMS) to assess how their organization interacts with the environment, then minimize [harmful impacts of] those interactions. International Organization for Standardization<sup>®</sup> (ISO) 14001 is the internationally approved standard for environmental management systems, with a driving force of continual improvement. Any organization that subscribes to the principles of ISO 14001 must be able to provide evidence that it continually strives to reduce its environmental impact. Effects of this standard also provide opportunity for external stakeholders to become involved in the organization's continual improvement process.<sup>4</sup> For more detail, refer to:

<http://www.iso.org/iso/home/standards/management-standards/iso14000.htm>

Exide demonstrated conformance and achieved certification for October 2012 – October 2015 under ISO 14001, the most important standard within the ISO 14000 series for small to large organizations. The design of this standard flows in the procedural cycles listed below.

- Plan:** Cultivates the beginning stages of becoming ISO 14001 compliant.
- Check:** Checking and correcting errors.
- Do:** Implements and operates the ISO 14001 standard within an organization.
- Review:** Review of the entire process by the organization's top management.
- Improve:** Cycle that never ends as an organization continually finds ways to improve their EMS.

The ISO 14001 standard is the only ISO 14000 series standard that allows an organization to be registered or "certified." A copy of Exide's certification is attached as Appendix E.

## **EMISSIONS INVENTORY**

### Point Sources

The Federal Clean Air Act, §172(c)(3), requires the development of emissions inventories for nonattainment areas. The KDHE Bureau of Air maintains a point source emissions inventory with up-to-date information on lead and other pollutants. KDHE uses this data to identify sources and emission levels, determine compliance with regulations, develop control and maintenance strategies, and analyze progress in attaining the NAAQS. Kansas requires Class I and Class II sources to report any emissions of lead or lead compounds.<sup>5</sup> KDHE maintains a database with emissions inventory data for more than 900 stationary source facilities in Kansas. KDHE posts a summary report of annual emissions from major and minor stationary sources for the National Emissions Inventory (NEI) on its website at (<http://www.kdheks.gov/emission/data.html>). This data is also reported to the EPA every year.

---

<sup>4</sup> © Copyright International Organization for Standardization (ISO). All rights reserved. This material is reproduced from ISO 14001:1996 with permission of the American National Standards Institute (ANSI) on behalf of ISO.

<sup>5</sup> K.A.R. 28-19-517 Class I operating permits; annual emission inventory, K.A.R. 28-19-546 Class II operating permits; annual emission inventory

### Source Classification

This facility is classified as a synthetic minor source and operates under a Class II Operating Permit-by-Rule and subsequent construction approvals.<sup>6</sup>

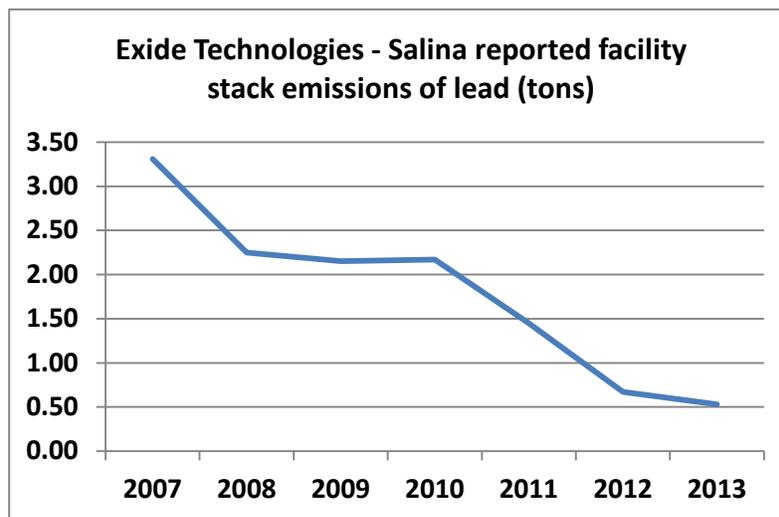
### Emissions Inventory Development

To meet the reporting requirements of Kansas Administrative Regulation (K.A.R.) 28-19-564, Exide submits their annual lead emissions data to KDHE where they are reviewed for quality assurance and stored electronically in Kansas' air facility management database (i-Steps). One of the requirements of the federally enforceable construction permit is that Exide submit a full Class I emissions inventory beginning with calendar year 2014 (to be submitted in 2015). The Class I emissions inventory form provides greater detail regarding emission points within the plant than the Class II form.

### Updated Emissions Inventory

Exide submitted emissions inventories for all lead-emitting units located at the company's manufacturing plant in Salina, Kansas as depicted in Figure 2, below. Emissions reported from 2007 to 2013 reveal consistent emission reductions between 2007 and 2008 followed by another significant downturn from 2010 to 2013.

**Figure 2: Salina Reported Facility Stack Emissions 2007 – 2013**



<sup>6</sup> January 15, 2004 permit issued by KDHE to Source ID 1690035 pursuant to K.A.R. 28-19-564 *Class II Operating Permits; Permit-by-Rule; Sources with Actual Emissions Less than 50 Percent of Major Source Thresholds.*

## MONITORING AND AMBIENT AIR QUALITY DATA

### Source-oriented Monitoring

According to 40 CFR Part 58, Appendix D, paragraph 4.5(a), source-oriented monitors are to be located at the predicted maximum ambient air lead concentration in excess of the NAAQS, while considering the potential for population exposure and logistics.

KDHE performed dispersion modeling in Saline County to determine the area of maximum concentration for sampler placement. A high volume (HiVol) total suspended particulate (TSP) sampler, installed on February 2, 2010, operates under AQS site ID 020-169-0004 on a 1-in-6 day schedule. The monitoring site (as displayed in Figure 3) is located north of the Exide manufacturing facility at the following legal description.

SOUTH INDUSTRIAL AREA, S1, T15, R3, BLOCK 2, ACRES 13.4, LTS 21-30 EXC E 32 LT 30

**Figure 3: Salina, Kansas Lead Source Monitoring Site(s)**



In 2013, KDHE installed a second HiVol TSP sampler at the Exide monitoring site for collocation purposes. Installed next to the existing monitor, the second monitor operates on the same 1-in-6 day sampling schedule as the initial lead monitor. The Salina Exide plant is the only Kansas source that exceeds the 0.5 ton per year point source threshold for the mandatory 2008 Lead NAAQS Nonattainment SIP inventory.

## Lead (Pb) Monitoring Network

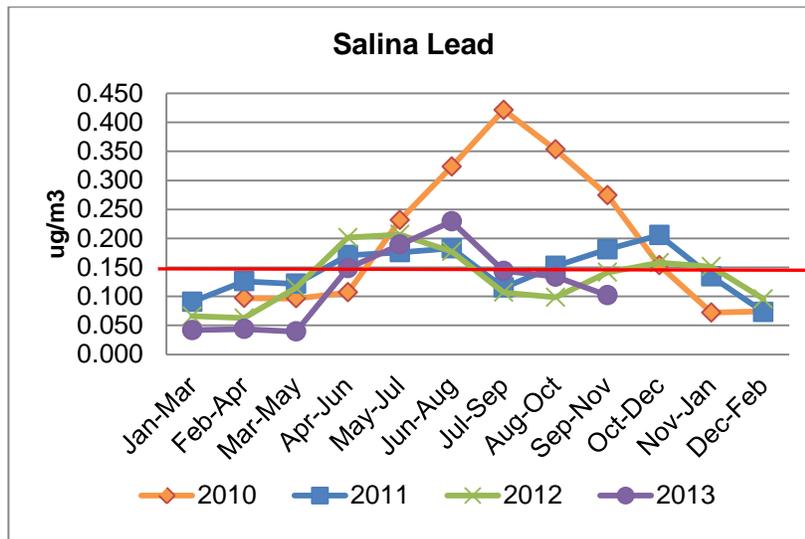
The KDHE Bureau of Air and local air quality agencies operate the [Kansas Air Quality Monitoring Network](#) which provides real-time monitoring and data analysis from 22 sites. EPA uses this data to calculate the air quality index, to determine criteria pollutant compliance with federal standards<sup>7</sup>, and to evaluate air quality trends. This quality-assured data is compiled and reported to the EPA.

Each year, in accordance with 40 C.F.R. Part 58, KDHE submits an annual monitoring network plan to EPA after completing public notice and comment request requirements. The *2010-2011 Kansas Ambient Air Monitoring Network Plan*, which included lead monitoring requirements, was approved by EPA in April 2011. All subsequent annual monitoring network plans were approved by EPA including the most recent 2013-2014 plan in December 2013.<sup>8</sup> Monthly and 3-month rolling average designed lead monitoring data from 2010-2013 may be viewed at:

[http://www.kdheks.gov/bar/air-monitor/lead/Updated\\_Lead\\_Monitoring\\_Results.pdf](http://www.kdheks.gov/bar/air-monitor/lead/Updated_Lead_Monitoring_Results.pdf).

Figure 4 visually represents Saline County air monitoring results for 2010 – 2013 in annual tracks of 3-month rolling averages. As charted, below, seven out of nine values fell within or below the required lead standard in 2013.

**Figure 4: Salina Lead Monitor 3-month Rolling Average Values**



KDHE also operates lead monitoring in Kansas City at the JFK multi-pollutant air monitoring station. A non-source oriented HiVol TSP sampler was installed at this site on December 27, 2011 and sampling began on January 4, 2012.

<sup>7</sup> CAA Section 110(a)(2)(B) Ambient air quality monitoring/data system

(B) provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to—

(i) monitor, compile, and analyze data on ambient air quality, and

(ii) upon request, make such data available to the Administrator;” [42 U.S.C. 7410(a)(2)(B)]

<sup>8</sup> Refer to <http://www.epa.gov/region07/air/quality/quality.htm#amnp> to review annual monitoring network plans.

## **INTERSTATE TRANSPORT**

Section 172(c)(7) of the CAA requires nonattainment SIPs to meet the applicable provisions of Section 110(a)(2). The KDHE reports that prior rule submittals, along with this attainment demonstration, address the requirements associated with rule development and maintain the necessary infrastructure and resources to comply with Section 110(a)(1) and (2) of the CAA for lead standards attainment.

Lead is a pollutant that does not undergo atmospheric transformation. Due to its physical properties, lead does not transport over significant distances. Lead particles settle out quickly with localized impacts. Lead emissions do not have a transport impact unless the source is in close proximity to state or international boundaries. Transport is not an issue for Kansas since its only recommended nonattainment area, consisting of a portion of Saline County, is more than 80 miles from the nearest state or international border. The technical document supporting the nonattainment designation for Salina-Saline County includes air quality dispersion modeling and can be found on EPA's lead designations website at:

<http://www.epa.gov/leaddesignations/2008standards/rec/region7R.html>

## **ATTAINMENT DEMONSTRATION MODELING**

Exide contracted with ENVIRON to perform dispersion modeling to estimate the ambient air lead concentrations within the nonattainment area. This modeling successfully demonstrates attainment of the 2008 Lead NAAQS based on the implementation of specific control measures. ENVIRON's *Air Quality Dispersion Modeling Report for SIP Attainment Demonstration* is attached as Appendix A. Emission reductions are expected to result in a maximum impact value of 0.137  $\mu\text{g}/\text{m}^3$  or less following completion of all emission control projects and paving of roadways and parking areas on the northwest section of the plant site.

### AERMOD Modeling System

Air dispersion modeling for the Salina Exide facility was performed using the most recent version of AERMOD (version 12345), the EPA-recommended dispersion model. The AERMOD modeling system consists of the following components, which were used for this modeling exercise:

AERMAP – a terrain data preprocessor for elevations and features that could influence dispersion.

AERMET – a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts.

AERSURFACE – a surface characteristics preprocessor.

BPIPPRM – a multi-building dimensions program used to determine the direction-specific building downwash parameters.

LEADPOST – a postprocessor used to calculate three-month average lead concentrations for each receptor and the maximum impact concentration using AERMOD monthly outputs.

## Modeling Analysis

For the attainment demonstration, there were ten lead-emitting point sources within the Exide facility and three volume sources representing fugitive emissions. The point sources included recent improvements to four general purpose (facility) baghouses (BH2, BH3, BH4, and BH5), planned replacement and increased stack height for a fifth general purpose baghouse (BH1), planned increased stack heights for five ball mill baghouses (BH11, BH12, BH13, BH14 and BH15), and an oxide mill source (OM) representing the planned discharging of all ten oxide mills from a raised combined stack. Volume sources used in the modeling represented fugitive emissions from the ball mill process (BALLFUG), from a neighboring facility (Metlcast), and from plant roadways.

## Background Lead Concentrations

EPA's final *Integrated Science Assessment for Lead (ISA)*, issued in June 2013, indicates that the national non-source oriented monthly average ambient lead concentration is  $0.01 \mu\text{g}/\text{m}^3$ . Tables 2-13 and 2-15 of the ISA provide detailed statistics based upon the national monitoring network. This average background concentration is further supported by data from a temporary non-source oriented lead monitor located north of the nonattainment area (average  $0.005 \mu\text{g}/\text{m}^3$ ) and data from a lead monitor formerly located in Wichita, Kansas (average  $0.0076 \mu\text{g}/\text{m}^3$ ). Since other lead-emitting sources in the area surrounding the Exide facility have been included in the model, the ISA reported national monthly averaged value of  $0.01 \mu\text{g}/\text{m}^3$  was used as the background concentration in the attainment demonstration modeling. EPA's final *Integrated Science Assessment for Lead (ISA)* can be found using the following link: <http://www.epa.gov/ncea/isa/lead.htm>

## Modeling Results

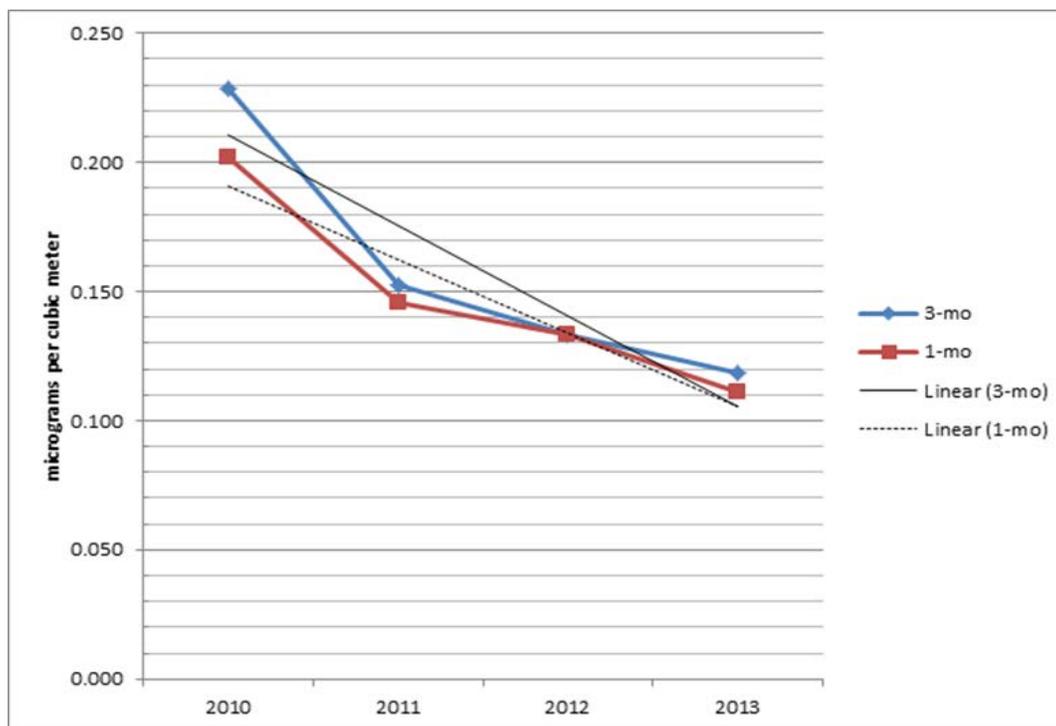
Cumulative impact was determined using the LEADPOST output file of modeled maximum three-month average lead concentrations for all source groups plus the background value of  $0.01 \mu\text{g}/\text{m}^3$ . The table below and a contour map of the three-month average lead concentrations demonstrate attainment of the 2008 Lead NAAQS.

**Table 2: Summary of Predicted Impacts at Maximum and Sensitive Receptors**

<b>Receptor</b>	<b>Maximum Impact (including <math>0.01 \mu\text{g}/\text{m}^3</math> background concentration)</b>
2008 Lead NAAQS	$0.15 \mu\text{g}/\text{m}^3$
Maximum Impact	$0.137 \mu\text{g}/\text{m}^3$
KDHE Ambient Lead Monitor	$0.127 \mu\text{g}/\text{m}^3$
Schilling Elementary School	$0.018 \mu\text{g}/\text{m}^3$
Coronado Elementary School	$0.028 \mu\text{g}/\text{m}^3$



**Figure 6: Decline of Annual Average Lead Monitor Values**



## CONTROL STRATEGY

The Clean Air Act (CAA) requires any state containing a designated nonattainment area to submit a state implementation plan (SIP) in accordance with the provisions of Section 172(c). Section 172(c) specifies, among other things, that nonattainment SIPs include Reasonably Available Control Measures (RACM), Reasonably Available Control Technology (RACT), Reasonable Further Progress (RFP), and contain contingency measures.

### Reasonably Available Control Measures & Reasonably Available Control Technology (RACM/RACT)

Section 172(c)(1) of the CAA requires that nonattainment SIPs “shall provide for the implementation of all reasonably available control measures 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) and shall provide for attainment of the national primary ambient air quality standards.” In March 2012, EPA issued a RACM guidance document, *Implementation of the 2008 Lead National Ambient Air Quality Standards: Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions*.<sup>9</sup> This document replaced prior RACM guidance for identifying potential measures for controlling lead emissions from lead sources in nonattainment areas.

<sup>9</sup> The EPA March 2012 RACM guidance for controlling lead emissions is available on EPA’s website: <http://www.epa.gov/airquality/lead/pdfs/2012ImplementationGuide.pdf>.

Using EPA’s 2012 RACM guidance, KDHE determined that Exide’s ongoing point source improvement activities and fugitive emissions control measures are sufficient for RACM/RACT purposes for the Salina nonattainment area at this time. The Salina area is projected to attain the 2008 Lead NAAQS by the 2016 attainment date as a result of these measures, which are discussed below and in Appendix B – Exide’s 2011 and 2013 Project Update Documents.

Point Sources - Control Activities

In April 2006, Exide commenced a five-year project to replace all ten oxide mills. The project included replacement of oxide mills, associated baghouses, and the addition of HEPA filters for each oxide mill source. This project was completed as follows in Table 3.

**Table 3: Oxide Mill Replacement Completion**

Source	Completed
Oxide Mills #1 and #2	September 2006
Oxide Mills #3 and #4	July 2009
Oxide Mills #5 and #6	October 2010
Oxide Mill #7	January 2011
Oxide Mill #8	February 2011
Oxide Mills #9 and #10	March 2011

Exide also made improvements with the replacement of four general purpose (facility) baghouses (BH2, BH3, BH4, and BH5). In May 2013, KDHE received notification of Exide’s intent to replace the fifth general purpose baghouse (BH1). The current status of the baghouse replacement project follows in Table 4.

**Table 4: Facility Baghouse Project Completion**

Source	Status
Baghouse #1 (BH1)	Installation Completed by February 19, 2014
Baghouse #2 (BH2)	Completed November 2010
Baghouse #3 (BH3)	Completed September 2009
Baghouse #4 (BH4)	Completed July 2011
Baghouse #5 (BH5)	Completed May 2012

Stack compliance tests were conducted for each point source after installation and commissioning. For attainment demonstration modeling, point source emission rates were determined using information from the average of three runs from stack tests for each source. The stack test dates are listed below in Table 5. The emission rates were estimated based on the highest measured average emission rate since 2007 or the most recent infrastructure update for the source.

**Table 5: Point Source Control Stack Tests**

Source		Stack Test Date
Facility	BH1	08/21/2008
	BH2	11/17/2010
	BH3	09/29/2009
	BH4	08/02/2011
	BH5	06/27/2012
Ball Mill	BH11	10/24/2007
	BH12	10/24/2007
	BH13	10/24/2007
	BH14	10/24/2007
	BH15	08/21/2008
Oxide Mill	OM1	08/22/2008
	OM2	08/21/2008
	OM3	08/27/2009
	OM4	08/25/2009
	OM5	08/04/2010
	OM6	07/15/2010
	OM7	03/17/2011
	OM8	05/05/2011
	OM9	05/06/2011
	OM10	05/05/2011-05/06/2011

In demonstrating ambient impacts less than the 2008 Lead NAAQS, and in alignment with the applicable federal New Source Performance Standard (NSPS)<sup>10</sup> and National Emission Standards for Hazardous Air Pollutants (NESHAP)<sup>11</sup>, the stacks for BH1 through BH5 and the oxide mills were modeled at about 3.5 times measured emission rates. The ball mill baghouses, BH11 through BH15, were modeled each at an emission rate of  $8.82 \times 10^{-4}$  grams per second (about 3.3 times the highest measured emission rate of all five ball mill baghouses). The emission rates in Table 6, below, and in Table 1-1a of the attainment demonstration modeling report (Appendix A to this report), represent the permitted allowable limits for each point source.<sup>12</sup> These limits have been incorporated into a federally enforceable construction permit, attached as Appendix C.

**Table 6: Point Source Control Emission Rates**

Source ID	Source Description	Lead Emission Rate, grams/second (g/s)	Lead Emission Rate, pounds/hour (lb/hr)
BH1	Baghouse 1	3.71 E-03	2.94E-02
BH2	Baghouse 2	1.73 E-03	1.37E-02
BH3	Baghouse 3	5.63 E-03	4.47E-02
BH4	Baghouse 4	1.85 E-02	1.47E-01
BH5	Baghouse 5	1.63 E-03	1.29E-02
BH11	Baghouse for Ball Mill 11	8.82 E-04	7.00E-03
BH12	Baghouse for Ball Mill 12	8.82 E-04	7.00E-03

<sup>10</sup> 40 C.F.R. Part 60 Subpart KK, Standards of Performance for Lead-Acid Battery Manufacturing Plants.

<sup>11</sup> 40 C.F.R. Part 63 Subpart PPPPPP, National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources.

<sup>12</sup> See Appendix A for a copy of the attainment demonstration report to this document

BH13	Baghouse for Ball Mill 13	8.82 E-04	7.00E-03
BH14	Baghouse for Ball Mill 14	8.82 E-04	7.00E-03
BH15	Baghouse for Ball Mill 15	8.82 E-04	7.00E-03
OM	Oxide Mills 1-10 (combined)	8.47 E-03	6.72E-02

### BALLFUG Source

The BALLFUG source in the 2013 attainment demonstration modeling represents fugitive emissions from the Exide facility's ball mill processes. In 2011, the emission rate for BALLFUG was estimated by Exide to be 28.16 pounds per month for the nonattainment designation recommendation modeling. Exide since has installed additional ventilation and closed prior building openings associated with this source. The Exide facility's lead processing operations are located within a negative pressure total enclosure and are fitted with local exhaust ventilation (LEV).

The negative pressure total enclosure with maintained LEV can be credited with 99 percent effectiveness in reducing fugitive emissions in accordance with a September 2012 letter from EPA Region 7 to Missouri DNR.<sup>13</sup> The EPA letter references a secondary lead smelter; however, it can apply similarly to the Exide lead acid battery manufacturing facility. The emission rate from the BALLFUG source has been decreased by 99 percent to a continuous emission of  $4.86 \times 10^{-5}$  grams per second ( $3.86 \times 10^{-4}$  pounds per hour). The following requirements have been incorporated into a federally enforceable permit:

**Ball Mill Process Fugitive Emissions Control Requirements** – Ball Mill process emissions shall be contained in a negative pressure total enclosure with maintained local exhaust ventilation at process points, reducing the Ball Mill process fugitive emissions by 99 percent from 338 pounds of lead per year to 3.38 pounds of lead per year. Total enclosure means that the building is completely enclosed with a floor, walls, and a roof to prevent exposure to the elements and to assure containment of lead bearing material with limited openings to allow access and egress for people and vehicles. The total enclosure must provide an effective barrier against fugitive dust emissions with the direction of air flow being inward through any openings and with the enclosure being maintained under constant negative pressure. Ball Mill process fugitive emissions of lead shall be less than or equal to  $4.86 \times 10^{-5}$  grams per second ( $3.86 \times 10^{-4}$  pounds per hour; 3.38 pounds per year), as modeled for the attainment of the 2008 Lead NAAQS. Negative pressure shall be maintained in the total enclosure at all times. The Ball Mill total enclosure standards are identified below in Table 7.

---

<sup>13</sup> Missouri DNR's lead SIP documents can be found here: <http://www.dnr.mo.gov/env/apcp/sips.htm#lead>. See Section 6.2 Capture Efficiency Discussion and Appendix K in the Missouri SIP for the Buick/Viburnum Trend Lead Nonattainment Area, <http://www.dnr.mo.gov/env/apcp/docs/buick-complete-submittal-pkg.pdf>, for supporting documentation on capture efficiency for total enclosures with negative pressure and local exhaust ventilation.

**Table 7: Ball Mill Total Enclosure Standards**

<p>Ball Mill Total Enclosure Standards</p>	<ol style="list-style-type: none"> <li>1. The total enclosure must be free of significant cracks, gaps, corrosion, or other deterioration that could cause lead bearing material to be released from the primary barrier.</li> <li>2. Measures must be in place to prevent the tracking of lead bearing material out of the enclosure by personnel or equipment.</li> <li>3. The total enclosure must be ventilated to ensure negative pressure values of at least 0.013 mm of mercury (0.007 inches of water).</li> <li>4. An inward flow of air must be maintained through all natural draft openings.</li> <li>5. The total enclosure must be inspected at least once every 30 days. Any gaps, breaks, separations, leak points, or other possible routes for emissions of lead to the atmosphere must be repaired within 30 days of identification unless an approval for an extension is obtained from KDHE before the repair period is exceeded. Inspection and repair records shall be kept on site for a minimum of two years and shall be made available to KDHE upon request.</li> </ol>
--	--

Roadways

Air dispersion modeling demonstrated that lead-in-roadway silt content would need to decrease in order to achieve attainment. Exide shall pave all plant roadways and parking lots subject to vehicular traffic on the northwest section by July 31, 2014.<sup>14</sup> This project is aimed at reducing the silt load and lead content to the levels similar to the dust loading and lead content on other paved roadways on the property and reducing the fugitive dust impact on ambient air monitors, as modeled for the attainment of the 2008 Lead NAAQS. All internal roadways and parking lots subject to vehicular traffic on the northwest section, a total area of 15,200 square yards, shall be paved to achieve the necessary results per the attainment demonstration modeling, which demonstrates a roadway fugitive lead emission reduction of 0.04 tons (80 pounds) per year, from 0.056 tons of lead per year to 0.016 tons of lead per year. This project has been incorporated into a federally enforceable permit.<sup>15</sup>

Summary of Recent Projects to be Completed

Table 8 below lists improvement projects with assigned and actual completion dates.

<sup>14</sup> A map of the area to be paved is included in the permit as Attachment 2.

<sup>15</sup> See Appendix C for a copy of the permit.

**Table 8: Recent Improvement Projects Completion**

<b>Project</b>	<b>Action</b>	<b>Completion Date</b>
Baghouses 11-15 (BH11-BH15), Ball Mill Stacks	Increase stack heights by 37 feet as demonstrated in attainment modeling.	July 19, 2013 Stack test completed on November 22, 2013
Oxide Mill (OM1-OM10), Oxide Mill Stacks	Manifold to new stack, 65 feet from ground level per attainment demonstration.	October 1, 2013 Stack test completed on November 22, 2013
Baghouse 1 (BH1)	Replace baghouse and increase stack height to 80 feet per attainment demonstration modeling.	Installation completed February 19, 2014
Paving Plant Roadways	Pave all internal roadways and parking lots subject to vehicular traffic on the northwest section per attainment demonstration modeling. Total area to be paved is 15,220 square yards.	July 31, 2014

All completed improvement projects and those yet to be completed, as well as any associated provisions, are included in the federally enforceable comprehensive permit issued by KDHE to the Salina Exide facility.

### **REASONABLE FURTHER PROGRESS (RFP)**

Nonattainment SIPs must provide for reasonable further progress (RFP), in accordance with Section 172(c)(2) of the CAA. Section 171 of the CAA defines RFP as “such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date.” According to the EPA, RFP for lead nonattainment areas should be met by the strict adherence to an ambitious compliance schedule that is expected to periodically yield significant emission reductions, and to the extent appropriate, linear progress. The EPA recommends that nonattainment SIPs provide a detailed schedule for compliance of RACM (including RACT) and accurately indicate the corresponding annual emission reductions to be achieved.<sup>16</sup>

Since 2006, Exide has been working on projects to reduce lead emissions. The majority of the improvement activities have occurred since 2009, after the Lead NAAQS was revised from 1.5 µg/m<sup>3</sup> to 0.15 µg/m<sup>3</sup> in November 2008. (See Appendix B for Exide’s 2011 and 2013 project update documents.) Table 9, below, demonstrates emission reductions through 2013 as met by “adherence to an ambitious compliance schedule.” With the completion of the Baghouse 1 (BH1) replacement and the roadways

<sup>16</sup> *Federal Register* Volume 73, Wednesday, November 12, 2008, [73 FR 66964](#), “National Ambient Air Quality Standards for Lead” Final Rule. See pages 67038-67039.

paving project in 2014, all emissions reductions will have been achieved well before the December 31, 2016, attainment date and there is no need to further demonstrate annual incremental reductions or linear progress for RFP. Exide's permit conditions, including emissions limits and the requirement to maintain less than or equal to 0.15  $\mu\text{g}/\text{m}^3$  at KDHE ambient air monitors, will ensure compliance with the NAAQS.

**Table 9: Emission Reduction Projects**

Year	Emissions Inventory Lead (Pb), Tons	Improvement Activities	Comments	Monitor, 3-month Avg Pb, <sup>17</sup> $\mu\text{g}/\text{m}^3$
2007	3.31	OM1 & OM2 (2006)		
2008	2.25			
2009	2.15	OM3 & OM4; BH3		
2010	2.17	OM5 & OM6; BH2		0.421
2011	1.45	OM7, OM8, OM9, OM10; BH4; Ball Mill Process Fugitive Control; Ball Mill Ventilation Upgrade	Lead NAAQS designation effective 12/31/2011 – base year for reductions	0.206
2012	0.67	BH5; Relocation of OM Diverter Valves	54% EI reduction	0.207
2013	0.53	BH11-15, Ball Mill Stacks; OM Stacks	63% EI reduction	0.144 <sup>18</sup>
2014		BH1; Plant NW Section Roadway Paving	Start of compliance period for 3 years clean data determination shows 33-47% reduction in monitored values for Nov 2013-Feb 2014 over Nov 2012-Feb 2013. <sup>19</sup>	0.140 <sup>20</sup>
2015		Continuous Improvement (CI); Best Management Practices (BMP) <sup>21</sup>		0.140 <sup>20</sup>
2016		CI; BMP		0.140 <sup>20</sup> 0.137 <sup>22</sup> 0.127 <sup>23</sup>

<sup>17</sup> Highest 3-month average during calendar year unless otherwise noted. Ambient air monitoring for lead implemented in 2010.

<sup>18</sup> 3-month rolling average monitor value for July-September 2013.

<sup>19</sup> 3-month rolling average for Nov 2012-Jan 2013 was 0.151  $\mu\text{g}/\text{m}^3$  versus 0.080  $\mu\text{g}/\text{m}^3$  for Nov 2013-Jan 2014; Dec 2012-Feb 2013 was 0.095  $\mu\text{g}/\text{m}^3$  versus 0.064  $\mu\text{g}/\text{m}^3$  for Dec 2013-Feb 2014.

<sup>20</sup> Projection for decline of annual highest 3-month rolling average monitor value towards the maximum impact value of 0.137  $\mu\text{g}/\text{m}^3$  identified in the attainment demonstration modeling (Appendix A) to occur after the completion of emission reduction projects.

<sup>21</sup> The Exide Salina facility is certified to ISO 14001. See certificate in Appendix E.

<sup>22</sup> Maximum impact value of 0.137  $\mu\text{g}/\text{m}^3$  by the attainment date of December 31, 2016, identified in the attainment demonstration modeling (Appendix A).

<sup>23</sup> Monitor 3-month average value of 0.127  $\mu\text{g}/\text{m}^3$  by the attainment date of December 31, 2016, identified in the attainment demonstration modeling (Appendix A).

As indicated in Table 9, Exide’s improvement projects schedule, to-date and ongoing, has resulted in significant reduction in lead emissions from the facility and in modeled attainment of the 2008 Lead NAAQS before the December 31, 2016 attainment date. Reasonable further progress for Exide, as the primary contributor to lead emissions in the Salina nonattainment area, will be monitored and evaluated by KDHE and will be based on the following.

1. Achieving a highest 3-month rolling average KDHE ambient air monitor value less than or equal to 0.15 µg/m<sup>3</sup> for any 3-month period beginning after July 31, 2014 (i.e., beginning with the average for Aug-Oct 2014).
2. On-schedule completion of projects, which include those listed below in Table 10.

**Table 10: Reasonable Further Progress Project Completion**

<b>Project</b>	<b>Action</b>	<b>Completion Date</b>
Baghouses 11-15 (BH11-BH15), Ball Mill Stacks	Increase stack heights by 37 feet as demonstrated in attainment modeling.	Completed July 19, 2013 Stack test November 22, 2013
Oxide Mill (OM1-OM10), Oxide Mill Stacks	Manifold to new stack, 65 feet from ground level per attainment demonstration.	Completed October 1, 2013 Stack test November 22, 2013
Baghouse 1 (BH1)	Replace baghouse and increase height to 80 feet per attainment demonstration modeling.	Completed February 19, 2014 Stack test March 20, 2014
Paving Plant Roadways	Pave all internal roadways and parking lots subject to vehicular traffic on the northwest section per attainment demonstration modeling. Total area to be paved is 15,220 square yards. (See map - Attachment 1)	Completed July 31, 2014

Section 172(c)(9) of the federal Clean Air Act requires the implementation of specific measures if the nonattainment area fails to maintain reasonable further progress. Upon failure to achieve and maintain reasonable further progress (RFP), root cause analysis and corrective and preventive action provisions shall be implemented in accordance with Table 11 below. The above RFP measures have been incorporated into a federally enforceable permit as exhibited in Appendix C.



<ul style="list-style-type: none"> <li>• Exide shall compile analyses and results from the contingency measures described above in addition to performing the following: <ul style="list-style-type: none"> <li>○ Exide shall implement further compliance plan measures for controls on sources and areas of lead emissions on site that were identified pursuant to Section XI of the permit or as a result of Exide’s root cause analysis and corrective/preventive action process or other analyses. Exide shall submit to KDHE documentation of implemented measures, including identification of measures and timeline for implementation and effect.</li> <li>○ Exide shall implement measures from the fugitive dust control plan for the site as developed by Exide per Section XI of the permit. Exide shall submit to KDHE documentation of implemented measures, including identification of measures and timeline for implementation and effect.</li> </ul> </li> </ul>	<p>To be implemented in accordance with KDHE-approved schedule as part of compliance plans developed per Section XI Contingency Measures</p>
<ul style="list-style-type: none"> <li>• Exide shall conduct stack testing on an increased frequency as determined by KDHE. The scope and frequency of the increased stack tests will be based on an evaluation by KDHE of the information submitted in the root cause analysis triggered by a violation of the lead standard. The supplemental stack tests required by KDHE will be limited to those stacks that the root cause analysis shows have the potential to contribute to the increase in monitored lead concentrations. KDHE will reduce the required frequency to the frequencies outlined in Table 1 of the permit once the additional stack tests demonstrate that the stacks in questions do not show a significant increase above their baseline stack test rates.</li> </ul>	<p>Upon notification by KDHE to Exide</p>
<ul style="list-style-type: none"> <li>• Exide shall re-model with proposed changes to emission rates and/or work practices, improvements to the remainder of roadways and parking lots within plant boundaries, and any proposed changes to other parameters or conditions (which may include throughput). Exide shall submit to KDHE for approval a revised demonstration for the timely attainment and maintenance of the 2008 Lead NAAQS, which shall include the implemented changes and a timeline for implementation and effect.</li> </ul>	<p>60 days after KDHE notifies Exide</p>

**OUTREACH**

KDHE promoted efforts to communicate information to the public during early phases of 2008 Lead NAAQS nonattainment area findings in and around Salina and ensuing designation activities. The agency distributed a Press Release in June 2011 summarizing the new (2008) Lead NAAQS threshold and its effects including new air pollution controls, equipment upgrades, and other actions necessary to achieve airborne lead standard compliance. KDHE and Salina’s Exide manufacturing plant established extensive corrective measures to reduce lead emissions and their detrimental effects.

*On February 23, 2011:* KDHE facilitated a meeting that included a *Lead Air Quality Issues* presentation in Salina for Exide, City of Salina, Saline County, and Salina-Saline County Health Department staff followed by discussion.

*On June 28, 2011:* KDHE held a public meeting in Salina to provide a *Salina Air Quality Public Meeting* overview of the new air quality standard for lead emissions monitoring, nonattainment designation and SIP requirements.

For additional public participation activities, refer to:

[http://www.kdheks.gov/bar/air-monitor/lead/Salina\\_Air\\_Quality\\_Public\\_Meeting\\_June\\_28\\_2011\\_Presentation.pdf](http://www.kdheks.gov/bar/air-monitor/lead/Salina_Air_Quality_Public_Meeting_June_28_2011_Presentation.pdf)

*On November 10, 2011:* Kansas published a public hearing notice inviting comments concerning the proposed *2008 Lead NAAQS Infrastructure SIP (i-SIP)* in the Kansas Register, on the KDHE BOA public notice website, the Salina, Topeka, Hays, Wichita, Dodge City and Chanute newspapers, and KDHE District Offices in the same locations. No requests for a hearing or comments were received by December 13th so the public hearing was cancelled via KDHE BOA website announcement, along with public comment period closure on December 13, 2011.

KDHE and Saline County local health officials provided education and outreach to the Saline County community, including blood lead testing which indicated elevated levels in both children and adults. Case management efforts were provided through KDHE Healthy Homes programs and the Salina Local Health agency. Kansas Statutes Annotated (K.S.A.) 65-1200 through 65-1214 authorize the Secretary of KDHE to investigate the extent of childhood lead poisoning in Kansas and to develop a data management system designed to collect and analyze information on childhood blood lead poisoning. The KDHE Bureau of Epidemiology and Public Health Informatics (BEPHI) maintains a database of blood lead test results for tests administered on children and adults living in Kansas. Kansas Administrative Regulation (KAR) 28-1-18 specifies that laboratories must report the results of all blood lead test results to KDHE. Analysis of the blood lead test results within the database helps to improve knowledge about the environmental factors contributing to lead exposure among Kansans.

### Public Participation Requirements

In accordance with Section 110(a)(2) of the CAA, Kansas is required to hold a public hearing prior to adoption of this SIP revision and subsequent submittal to EPA. KDHE notified the public and other stakeholders of an upcoming public hearing and required 30-day comment period prior to the tentatively scheduled hearing for this proposed 2008 Lead NAAQS SIP Revision for Attainment Demonstration, as follows.

Specific to 40 CFR 51.102 (*Public Participation Requirements*), KDHE complies with public notice requirements for this SIP revision. The opportunity to submit written comments, request a public hearing and/or participate in a public hearing, was advertised in the Kansas Register, the Salina, Wichita, Hays, Dodge City, Chanute, and Topeka newspapers, the KDHE District Offices, and on the KDHE BOA website at [www.kdheks.gov/bar/planning/pnplanning.html](http://www.kdheks.gov/bar/planning/pnplanning.html), at least thirty days prior to the tentatively scheduled date for the hearing. Information regarding the date, place, and time of the public hearing was included in the notice along with information on how to request the hearing or ascertain whether the hearing would be cancelled.

No hearing was requested and none was held. One comment was received and addressed in the Responsiveness Summary (see Appendix D). Notice of cancellation of the hearing was provided as set forth in the public notice of the proposed SIP revision.

A statement verifying public participation compliance was included in the certification letter to EPA and copy of the required public notice and tentatively-scheduled public hearing cancellation documents included with this report, as Appendix D.

In addition to the public notice for this State Implementation Plan, a separate 60-day public comment period was opened for the issuance of the federally enforceable permit. That comment period ran from June 12, 2014 to July 16, 2014. No comments were received and a hearing was not requested.

## **CONCLUSION**

The control measures that Salina Exide Technologies and KDHE have established and enforced since 2008 reveal improvement in lead emission reductions, overall. Additional control measures will be implemented if ongoing monitoring results warrant them for the nonattainment area in Saline County.

Exide's continual point source improvements and existing fugitive emission control measures already in place include:

- Ball Mill total enclosure with negative pressure
- Roadway paving
- Facility baghouse replacements
- Oxide mill replacements
- Oxide mill process and structural improvements

Specifically identified contingency measures are incorporated into a federally enforceable construction permit [KDHE C-12206] for Exide to implement upon evidence of air monitoring exceedance triggers determined by Exide and KDHE monitoring. The permit serves to supplement all construction and operating permits previously issued to Exide. Based on recent and ongoing improvements and control measures, KDHE projects the Salina area will reach attainment of the 2008 Lead NAAQS by the required December 31, 2016 attainment date.

The Kansas Department of Health and Environment posits the State meets its CAA Section 191(a) obligation to submit a plan for the Salina/Saline County (Exide) Lead Nonattainment Area under the 2008 lead NAAQS via this SIP for Attainment Demonstration. This document demonstrates attainment of the 2008 lead NAAQS through air dispersion modeling of an effective control strategy and compliance with all requirements of Section 172(c) regarding this standard for the Exide Technologies lead nonattainment area.

This page intentionally left blank