# Working Group Meeting #1
# Proposed Amended Rule 1420
# Emissions Standard for Lead

**March 8, 2017**

**SCAQMD Headquarters**

Diamond Bar, CA

# Lead National Ambient Air Quality Standard

- Federal Clean Air Act requires U.S. EPA to set National Ambient Air Quality Standards (NAAQS) for lead and criteria pollutants
- Lead NAAQS set by EPA in 1978 at 1.5 $\mu g/m^3$ averaged over a calendar quarter
- 2008 US EPA amended the Lead NAAQS by:
  - Lowering lead standard ten-fold from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$; and
  - Revising averaging period to a 3-month rolling average

# 2008 EPA Lead NAAQS

- Revisions to the 2008 Lead NAAQS based on:
  - More than 6,000 new studies conducted since 1990
  - Adverse health effects shown at much lower levels of lead in blood than previously recognized
    - Children found to be most vulnerable
    - Low levels of exposure linked to poor IQ, learning and memory in children

# Health Effects of Lead

- A neurotoxin which interferes with brain and nervous system development
- A probable human carcinogen
- Broad range of health effects:
  - Children: Effects nervous system and brain, weakens immune system
  - Adults:  Increased blood pressure, cardiovascular disease, decreased kidney function

# Attainment Status

- Dec. 31, 2010 - EPA designated a portion of L.A. County as nonattainment for the 2008 lead NAAQS
  - Based on 2007 – 2009 data period
  - Exceedances recorded at two (2) source-specific monitors located in Vernon and the City of Industry
  - Two (2) large lead acid battery recyclers identified as being in violation
- For 2009 – 2011 data period, only Vernon monitor still exceeded lead standard
- 2012 - SCAQMD Governing Board adopted lead State Implementation Plan (SIP)

# SIP Commitments

- SIP attainment strategy committed to:
  - A control measure to amend Rule 1420
  - Lowering the ambient limit to 0.15 µg/$m^3$ to correspond with the 2008 lead NAAQS
  - Retaining more stringent averaging period of a 30 day rolling average
  - Adding language to Rule 1420 to clarify New Source Review (NSR) requirements for stationary lead sources, consistent with SCAQMD's Reg. XIII and federal NSR requirements

# Rule 1420 Series Approach

## Rule 1420

- Adopted in September 1992
- "Catch All Rule" – applicable to facilities that use or process lead-containing materials

## Rule 1420.1

- Initially adopted in 2010
- Amended in 2014 and 2015
- Applicable to lead-acid battery recycling facilities that process more than 50,000 tons of lead a year
- Originally affected two facilities – Exide Battery and Quemetco (Exide shutdown in 2015)

## PAR 1420.2

- Adopted in October, 2015
- Applicable to facilities melting more than 100 tons of lead annually
- Affected 13 facilities
- Includes iron and steel mills, storage battery manufacturers, aluminum secondary smelting and alloying operations, nonferrous metal foundry

# Lead Concentration Limits in Rule 1420.1 and 1420.2

| SCAQMD Regulation | Effective Dates | Ambient Lead Concentration ($\mu g/m^3$) averaged over any 30 consecutive days |
|---|---|---|
| Rule 1420.1 | Prior to 1/1/16 | 0.15 |
| | 1/1/16 – 12/31/16 | 0.11 |
| | On or after 1/1/17 | 0.10 |
| Rule 1420.2 | 10/2/15 – 3/31/18 | 0.15 |
| | On or after 4/1/18 | 0.10 |

# EPA's Approach to Establishing the 2008 Lead NAAQS

- Use of an evidence-based or air-related IQ loss framework that took into consideration:
  - Ambient lead standard level (μg/$m^3$)
  - Air-to-blood ratios (in μg/dL blood lead per μg/$m^3$ air concentration)
  - Slope for concentration-response (C-R) function in terms of IQ decrement per μg/dL blood lead)
- EPA used a central value of air-to-blood ratio of 1:7 (The range varies from 1:5 to 1:10)
  - An air-to-blood ratio of 1:7 correlates with a mean air-related IQ loss of 2 points and an ambient level of 0.15 μg/$m^3$
  - An air-to-blood ratio of 1:10 correlates with a mean air-related IQ loss of 2 points and an ambient level of 0.10 μg/$m^3$

# Justification for 0.10 µg/m$^3$

- Air-to-Blood Ratio of 1:10 provides more protection for segment of population (children under age 5) most vulnerable to lead exposure than a ratio of 1:7
- Support for use of air-to-blood ratio closer to 1:10
  - Clean Air Scientific Advisory Committee (CASAC) recommends use of an air-to-blood ratio closer to 1:9 – 1:10
  - EPA's Children's Health Protection Advisory Committee (CHPAC, 2008)
  - The Northeast States for Coordinated Air Use Management (NESCAUM)
  - Michigan Department of Environmental Quality



# Justification for 0.10 µg/m$^3$ *(Continued)*

## Other (Child) Related Health Issues

- Affected at exposure levels appreciably lower than previously recognized
- The developing nervous system in children is among the most sensitive end-points
- Pre-school children or children under five years old are most vulnerable to exposure and adverse health effects
- Younger children absorb substantially more lead than adults, especially those under 2 years of age
- No study has determined a level of lead in blood that does not impair child cognition, with effects being long-lasting
- Damage to a child's developing brain is not reversible

# Initial Concepts for PAR 1420 Ambient Concentrations

- Current Rule 1420 has an ambient lead concentration standard of 1.5 µg/m$^3$ averaged over 30 days
- Proposing to revise ambient lead concentration consistent with Rules 1420.1 and 1420.2
  - 0.15 µg/m$^3$ averaged over any 30 days, date of adoption
  - 0.10 µg/m$^3$ averaged over any 30 days, phased schedule
  - Considering phased schedule similar to Rule 1420.2

| SCAQMD Regulation | Effective Dates | Ambient Lead Concentration (µg/m$^3$) averaged over any 30 consecutive days |
|---|---|---|
| Rule 1420.2 | 10/2/15 – 3/31/18 | 0.15 |
| | On or after 4/1/18 | 0.10 |

# Potential Universe for PAR 1420

- Reviewed SCAQMD permitting databases to:
  - Identified industry categories based on North American Classification Systems (NAICS) codes
  - Identified equipment lists for facilities in each NAICS category based on:
    - Basic equipment that could be lead-related
    - Control equipment that could be lead-related
- Reviewed inspection reports to capture information not included in permitting database of equipment lists
- Reviewed emissions data reported through the Annual Emissions Reporting (AER) program to identify sources reporting lead emissions

# Potentially Affected Sources

| Facility Description | No. of Facilities |
|---|---|
| **Iron and Steel Mills, Secondary Smelters and Foundries** | |
| Iron and Steel Mills | 3 |
| Secondary Smelting | 3 |
| Aluminum Rolling, Drawing and Extruding | 12 |
| Iron Foundries | 5 |
| Non-Ferrous Metal and Die Casting Foundries | 14 |
| Aluminum Foundries | 20 |
| **Storage Battery Manufacturing (lead-acid and Ni – Cd rechargeable)** | 1 |
| **Aircraft Parts Manufacture and Assembly** | |
| Aircraft (Parts) Manufacturing & Assembling | 2 |
| Aircraft Parts Manufacturing (except engines), including Prototypes | 3 |
| **Electroplating and Electronics, including Printed Circuit Boards** | |
| Electroplaters (Tin Plating) | 10 |
| Electronics and Printed Circuit Board Manufacturing and Assembly | 40 |
| | |



# Characteristics of Source Categories

- Iron and steel mills, secondary smelters, foundries
  - Raw materials consist of predominantly large volumes of scrap metals
  - Very high temperatures of operation
  - Raw materials may contain lead and other toxic metals
- Storage battery manufacturing
  - Raw materials predominantly consist of lead
- Aircraft parts manufacturing and assembling
  - Raw materials consist of specific metals and specialty alloys
  - Raw materials contain multiple trace metals
  - Very high temperatures of operation
- Electroplaters and electronics, including printed circuit boards
  - Primarily tin plating and lead soldering operations
  - Raw materials contain lead
  - Raw materials volumes relatively small
  - Relatively lower temperatures of operation



# PAR 1420 Initial Concepts

- Lower lead ambient concentration standard consistent NAAQS, Rule 1420.1 and Rule 1420.2
- Point source requirements
  - Evaluate control efficiency approach
  - Control efficiency may not be suitable for analyzing low-emitting sources; considering an emission rate approach
- Update source testing
  - Existing Rule 1420 required a one-time source test
  - Periodic source testing needed to verify compliance
- Enclosures
  - Existing Rule 1420 does not require enclosures
  - Enclosures are effective for containing fugitive emissions
  - Assessing appropriate type of enclosures for PAR 1420 sources

# PAR 1420 Initial Concepts *(Continued)*

- More prescriptive housekeeping measures
- Considering on-ramp for ambient monitoring
- Amend current exemption
  - Under Rule 1420, facilities that process more than 2 tons of lead per year and emit less than 0.5 pounds of lead per day (182.5 pounds per year) not required to:
    - Vent emissions to a collection system
    - Duct emissions (that are vented to a collection system) to a lead control device
    - Source test
    - Conduct ambient lead monitoring
    - Conduct air dispersion modeling
  - Evaluating scope of exemption
  - Threshold too high

# Next Steps

| Action | Target Dates |
|---|---|
| Next Working Group Meeting | Early April 2017 |
| Continue Field Visits | 1st and 2nd Quarters 2017 |
| Public Workshop | 2nd or 3rd Quarter 2017 |
| Set Hearing/Public Hearing | Oct/Nov 2017 |