SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Environmental Assessment for:

Proposed Rule 1420.2 Emissions Standards for Lead from Lead Melting Facilities

October 2015

SCAQMD No. 150716
SCH: 2015071050

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Preface

This document constitutes the Final Environmental Assessment (EA) for Proposed Rule (PR) Rule 1420.2 – Emission Standards for Lead from Lead Melting Facilities. The Draft EA was released for a 32-day public review and comment period from July 17, 2015 to August 18, 2015. Subsequently, a Revised Draft EA, which included formatting changes to Appendix B, was released for a 30-day public review and comment period from July 21, 2015 to August 19, 2015. One comment letter was received on the Draft EA. The comment letter and response to comments are included in Appendix C.

Since the June version of PR1420.2, SCAQMD staff has been working with stakeholders and has revised some of the provisions. The approach and core provisions requiring ambient monitoring of lead, the ambient lead concentration limits, lead point source requirements, requirements for operating within an enclosure, housekeeping and maintenance, and requirements for a compliance plan if certain thresholds are exceeded have not changed. In general, the revisions provided clarifications, provided other compliance options, or reduced the frequency of implementing specific provisions. As discussed in Chapter 2, modifications to the proposed rule will not increase or create any new environmental impacts and in areas where the frequency of implementing certain housekeeping measures is reduced, will lessen certain environmental impacts.

To facilitate identification, modifications to the document are included as underlined text and text removed from the document is indicated by strikethrough. SCAQMD staff has reviewed the modifications to PR 1420.2 and concluded that none of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15073.5. Therefore, this document now constitutes the Final EA for PR 1420.2.

CHAPTER 1

PROJECT DESCRIPTION

Introduction

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INTRODUCTION

Proposed Rule 1420.2 – Emission Standards for Lead from Metal Melting Facilities applies to lead melting facilities that process more than 100 tons of lead a year. The purpose of Proposed Rule 1420.2 (PR 1420.2) is to protect public health by reducing exposure to emissions of lead from these facilities and to help ensure attainment of the National Ambient Air Quality Standard for lead.

South Coast Air Quality Management District (SCAQMD or District) staff is currently proposing Rule 1420.2 to reduce lead emissions from metal melting facilities by limiting the ambient lead concentration and requiring housekeeping and maintenance provisions to reduce the amount of lead emitted into the air from point and fugitive sources. Hence, this reduces the further accumulation of lead dust in and around these facilities to better ensure protection of public health.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PR 1420.2 is a discretionary action, which has the potential to result in direct or indirect changes to the environment and, therefore, is considered a "project" as defined by the California Environmental Quality Act (CEQA). SCAQMD is the lead agency for the proposed project and has prepared this Revised Draft Environmental Assessment (EA) with no significant adverse impacts pursuant to its Certified Regulatory Program. California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written document in lieu of an environmental impact report or negative declaration once the Secretary of the Resources Agency has certified the regulatory program. SCAQMD's regulatory program was certified by the Secretary of the Resources Agency on March 1, 1989, and is codified as SCAQMD Rule 110. Pursuant to Rule 110, SCAQMD has prepared this Revised Draft EA.

CEQA and Rule 110 require that potential adverse environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid significant adverse environmental impacts of these projects be identified. To fulfill the purpose and intent of CEQA, the SCAQMD has prepared this Revised Draft EA to address the potential adverse environmental impacts associated with the proposed project. The Revised Draft EA is a public disclosure document intended to: (a) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental effects of the proposed project; and, (b) be used as a tool by decision makers to facilitate decision making on the proposed project.

SCAQMD's review of the proposed project shows that the proposed project would not have a significant adverse effect on the environment. The analysis in Chapter 2 supports the conclusion of no significant adverse environmental impacts. Therefore, pursuant to CEQA Guidelines §15252, no alternatives or mitigation measures are required to be included in this Revised Draft EA. Comments received on the Revised Draft EA during the 30-day public review period will be addressed and included in the Final EA.

PROJECT LOCATION

The SCAQMD has jurisdiction over an area of 10,473 square miles, consisting of the four-county South Coast Air Basin (Basin) and the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB and MDAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of both Riverside County and the SSAB and is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (see Figure 1-1~~Figure 1-1~~).

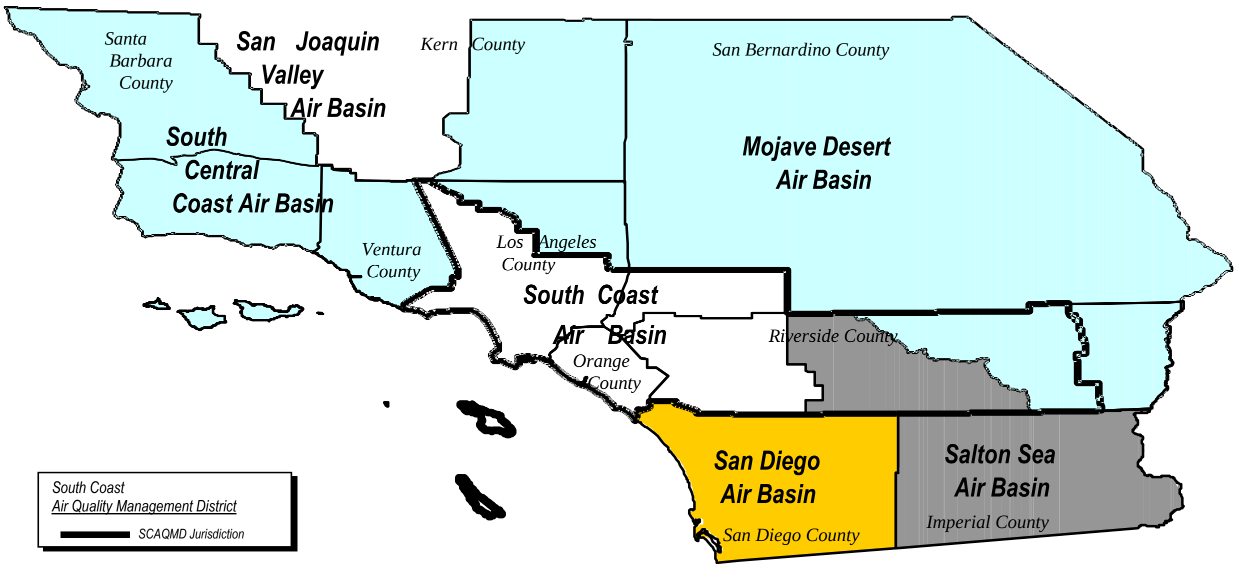


Figure 1-1 Boundaries of the South Coast Air Quality Management District

PROJECT OBJECTIVES

The objectives of PR 1420.2 are to protect public health by further reducing lead emissions from metal melting facilities by:

- Establishing an ambient air lead concentration limit;
- Requiring air monitoring and sampling for ambient lead;
- Establishing lead reduction efficiencies for lead point sources;
- Requiring total enclosures for metal melting and associated processes;
- Establishing housekeeping and maintenance provisions;
- Requiring submittal of compliance plans if ambient air concentration limits for lead or total facility mass emission rate from point sources are exceeded; and
- Requiring periodic source testing of lead point source controls.

PROJECT BACKGROUND

Health Effects of Lead

Lead is classified as a "criteria pollutant" under the federal Clean Air Act. It is also identified as a carcinogenic toxic air contaminant (TAC) by the Office of Environmental Health Hazard Assessment (OEHHA). Chronic health effects include problems such as nervous and reproductive system disorders, neurological and respiratory damage, cognitive and behavioral changes, and hypertension. Also, exposure to lead may increase the risk of contracting cancer or result in other adverse health effects. Young children are especially susceptible to the effects of environmental lead given that their bodies accumulate lead more readily than do adults and because they are more vulnerable to certain biological effects of lead including learning disabilities, behavioral problems, and deficits in IQ.

During the U.S. EPA's recent review of the lead NAAQS the U.S. EPA Administrator concluded that the current lead NAAQS of 0.15 $\mu g/m^3$ should be retained given that it provides requisite protection of public health. However, the Administrator noted that a threshold blood-lead level with which nervous system effects, and specifically, cognitive effects, occur in young children cannot be discerned from the currently available studies. Further, in the U.S. EPA's recent Policy Assessment for the Review of the Lead NAAQS, the U.S. EPA explicitly stated "with regard to our understanding of the relationship between exposure or blood lead levels in young children and neurocognitive effects, the evidence in this review…does not establish a threshold blood lead level for neurocognitive effects in young children. Furthermore, based on information provided in the U.S. EPA's recent policy assessment document and proposed rule, an ambient lead concentration of 0.15 $\mu g/m^3$ correlates to a potential IQ decrement of approximately two (2) points in young children exposed to elevated levels of lead. As a result, SCAQMD staff is proposing additional measures in PR 1420.2 to reinforce the protection of public health from significant sources of lead emissions.

The NAAQS is a national standard for lead which applies uniformly to all parts of the United States. In contrast, PR1420.2 is a source-specific rule that regulates specific lead melting facilities. Proposed Rule 1420.2 establishes an ambient lead limit of 0.100 $\mu g/m^3$, and implements other requirements to minimize the release of point source and fugitive lead emissions from such lead melting facilities and thereby to minimize the accumulation of lead surface and soil dust, both of which are meant to be more health protective. The proposed level considers that communities with children live around lead melting facilities, and it provides additional protection for the population most at-risk from lead emissions: pre-school children under the age of five.

Regulatory History

The metal melting industry has been subject to regulation regarding lead for more than two decades. Below is a chronology of regulatory activity:

- November 1970, CARB set the state ambient air quality standard for lead at 1.5 µg/m^3 averaged over 30 days.
- October 1978, the U.S. EPA adopted the NAAQS for lead, requiring attainment with a lead ambient concentration of 1.5 µg/m^3 averaged over a calendar quarter.
- September 1992, the SCAQMD adopted Rule 1420 – Emissions Standard for Lead. The rule incorporated the state ambient air quality standard and required control devices on lead emission points, control efficiency requirements for lead control devices, housekeeping, and monitoring or modeling of ambient air quality.
- October 1992, OEHHA classified lead as a carcinogenic toxic air contaminant and assigned to it a cancer potency factor and a cancer unit risk factor.
- January 1993, CARB adopted the Airborne Toxic Control Measure for Emissions of Toxic Metals from Non-Ferrous Metal Melting. The state regulation required control devices for lead and other toxic metal emission points, control efficiency requirements for control devices, fugitive emission control, and recordkeeping.
- June 1997, the U.S. EPA adopted the National Emissions Standards for Hazardous Air Pollutants (NESHAP) from Secondary Lead Smelting. The federal regulation required lead emission concentration limits of lead control devices, control of process fugitive emissions, monitoring, recordkeeping, and reporting.
- On July 16, 2007, EPA finalized a regulation that affects lead emissions from all lead-acid battery manufacturing facilities that are area sources. The federal regulation required lead emission concentration limits, testing, monitoring, recordkeeping, and reporting requirements.
- On October 15, 2008, the U.S. EPA signed into regulation an amended NAAQS for lead of 0.15 µg/m^3.
- November 5, 2010, the SCAQMD adopted Rule 1420.1 – Emissions Standard for Lead from Large Lead-acid Battery Recycling Facilities. The rule established requirements for total enclosures of areas used in the lead-acid battery recycling operation, ambient air lead concentration limits, ambient air monitoring, and housekeeping practices. Additional rule amendments followed the initial adoption in January of 2014, March of 2014, and March of 2015.
- December 14, 2010, the U.S. EPA made final revisions to the ambient monitoring requirements for measuring lead in the air. These amendments expand the nation's lead monitoring network to better assess compliance with the 2008 National Ambient Air Quality Standards for lead.
- January 2, 2015, the U.S. EPA proposed that the ambient lead concentration standard of 0.15 µg/m^3 averaged over a rolling 3-month period remain unchanged. The 90-day comment period for this proposal ended on April 6, 2015 and requires further action by the U.S. EPA.

The following provides additional background information about Rule 1420 and the 2008 NAAQS for lead.

Rule 1420

Rule 1420 was adopted in September 1992 and has not been amended since its adoption. Rule 1420 applies to facilities that process or use lead-containing materials that include, but is not limited to, primary or secondary lead smelters, foundries, lead-acid battery manufacturers or recyclers, and lead-oxide, brass and bronze producers. Rule 1420 is based on the current state ambient air quality standard of 1.5 µg/m^3 averaged over a 30-day period. The rule includes requirements for point source controls, monitoring, sampling, recordkeeping, and reporting. Rule 1420 requires facilities that process more than two tons of lead per year to submit a Compliance Plan that provides information on how the facility will conduct monitoring, air dispersion modeling, and implement requirements to install and implement point source controls.

2008 NAAQS for Lead

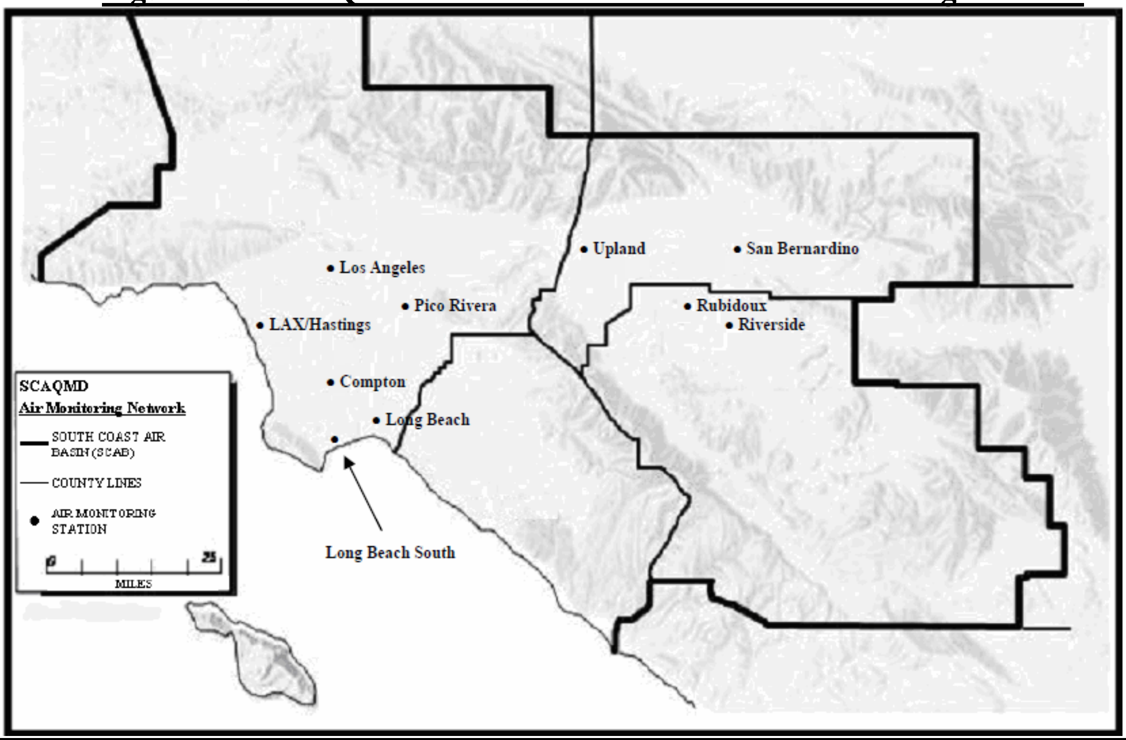
Since U.S. EPA established the initial standard of 1.5 µg/m^3 in 1978, scientific evidence about lead and health has expanded dramatically. More than 6,000 new studies on lead health effects, environmental effects, and lead in the air have been published since 1990. Evidence from health studies shows that adverse effects occur at much lower levels of lead in the blood than previously thought. As a result, U.S. EPA amended the NAAQS for lead that now reduces the ambient air quality standard from 1.5 µg/m^3 to 0.15 µg/m^3. The 2008 lead NAAQS requires full attainment by each state no later than five years after final designations for attainment status are made. Demonstration of attainment is based on measurements using a rolling 3-month averaging form to be evaluated over a 3-year period. Measurements are to be determined by U.S. EPA-required monitoring networks within each state which consist of both source-oriented and non-source-oriented monitors. The SCAQMD has already established the required monitoring network for both source and non-source-oriented lead monitors.

Further, in May of 2014, the U.S. EPA released its "Policy Assessment for the Review of the Lead National Ambient Air Quality Standards," reaffirming the primary (health-based) and secondary (welfare-based) staff conclusions regarding whether to retain or revise the current standards. As a result, in January of 2015 the U.S. EPA proposed that the ambient lead concentration standard of 0.15 µg/m^3 averaged over a rolling 3-month period remain unchanged. The 90-day comment period for this proposal ended on April 6, 2015 and requires further action by the U.S. EPA.

Non-Source-Oriented Monitors

The SCAQMD currently operates a non-source-oriented monitoring network of 10 locations throughout the Basin. The spatial distribution of these sites is shown below in Figure 1-2. Because the SCAQMD's current lead monitoring network meets the minimum requirements for the U.S. EPA non-source-oriented monitoring network as specified in the new lead NAAQS, data from the existing monitors were used to provide an indication of lead attainment status on a regional scale. Data values from measurements made at non-source-oriented monitors in the Basin were reviewed for years 2007 through 2013 and showed concentrations below the 2008 NAAQS for lead of 0.15 µg/m^3 and range from 0.01 µg/m^3 to 0.03 µg/m^3.

Figure 1-2: SCAQMD Non-Source-Oriented Lead Monitoring Network



Source-Oriented Monitors

The SCAQMD currently operates existing source-oriented monitoring networks at the following four facilities: Trojan Battery Company in Santa Fe Springs, Quemetco, Inc. in the City of Industry, Exide Technologies in Vernon, and Gerdau in Rancho Cucamonga in order to meet the monitoring requirements of the new lead NAAQS. The SCAQMD continues to operate source-oriented monitors at the Exide and Quemetco sites, and Rule 1420.1 requires these facilities to conduct fence line monitoring. These facilities also must meet an ambient air lead concentration of 0.100 μg/m^3 averaged over any consecutive 30 days beginning January 1, 2017.

Ambient Air Monitoring at PR 1420.2 Facilities

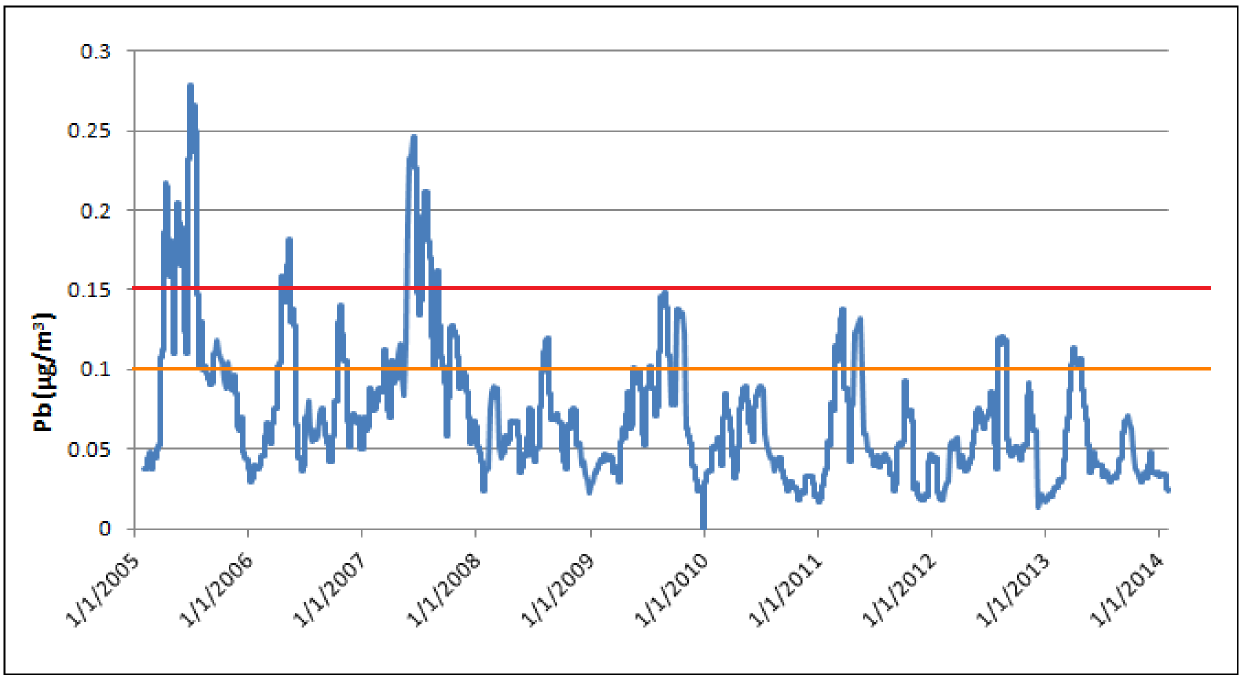
Two PR 1420.2 facilities currently have ambient air monitors to demonstrate compliance with the ambient air lead concentration limit of Rule 1420, or have ambient air monitors that are used by the SCAQMD for compliance demonstration with the 2008 NAAQS for lead. These two facilities are Trojan Battery~~ (which was discussed above)~~ and Gerdau, previously Tamco. Monitors are typically sited based on the maximum expected ground-level concentrations of lead at or beyond the property line of the facility. Monitoring data from these two facility types under the source category of metal melting have exhibited high ambient air lead concentration levels over the last decade, and show the ~~high~~ potential for exceedances of the 2008 Lead NAAQS.

Trojan Battery

Based on data from AER reporting years 2005 through 2007, lead emissions at Trojan Battery, a battery manufacturer located in Santa Fe Springs, were reported as 29 lbs/yr and sampling was conducted at one site located adjacent to the Trojan Battery facility. The site operates on a 1-in-6 day sampling schedule and had multiple rolling 30-day averages greater than 0.15 µg/m3 between years 2005 and 2011 with the highest average of 0.28 µg/m^3 in June 2005. Additionally, in 2005 through 2007, ambient air lead concentrations showing multiple 3-month rolling averages of greater than 0.15 µg/m3 were also measured (high of 0.21 µg/m^3). These measurements exceed the current NAAQS level for lead, although the measurements of these high ambient air lead concentrations occurred before the most recent version of the federal ambient air lead standard went into effect. Figure 1-3 below illustrates rolling 30-day averages for ambient air lead concentrations monitored by SCAQMD at Trojan Battery. Reported lead emissions data (2010 - 2013) for Trojan Battery indicate an average annual lead emissions value of 15 lbs/year. Since 2011, ambient air lead concentration levels have appreciably decreased, however, the lower levels coincide with the relocation of the SCAQMD monitor in October 2011. The monitor was relocated from its original location at the request of the owner of the property, as the owner stated that the location of the SCAQMD monitor was inhibiting business operations. As such, the lower ambient air lead concentration levels measured by the monitor since its relocation may not reflect maximum ground level concentrations.

Figure 1-3: 2005-2014 SCAQMD Monitoring at Trojan Battery

(Rolling 30-day Average)

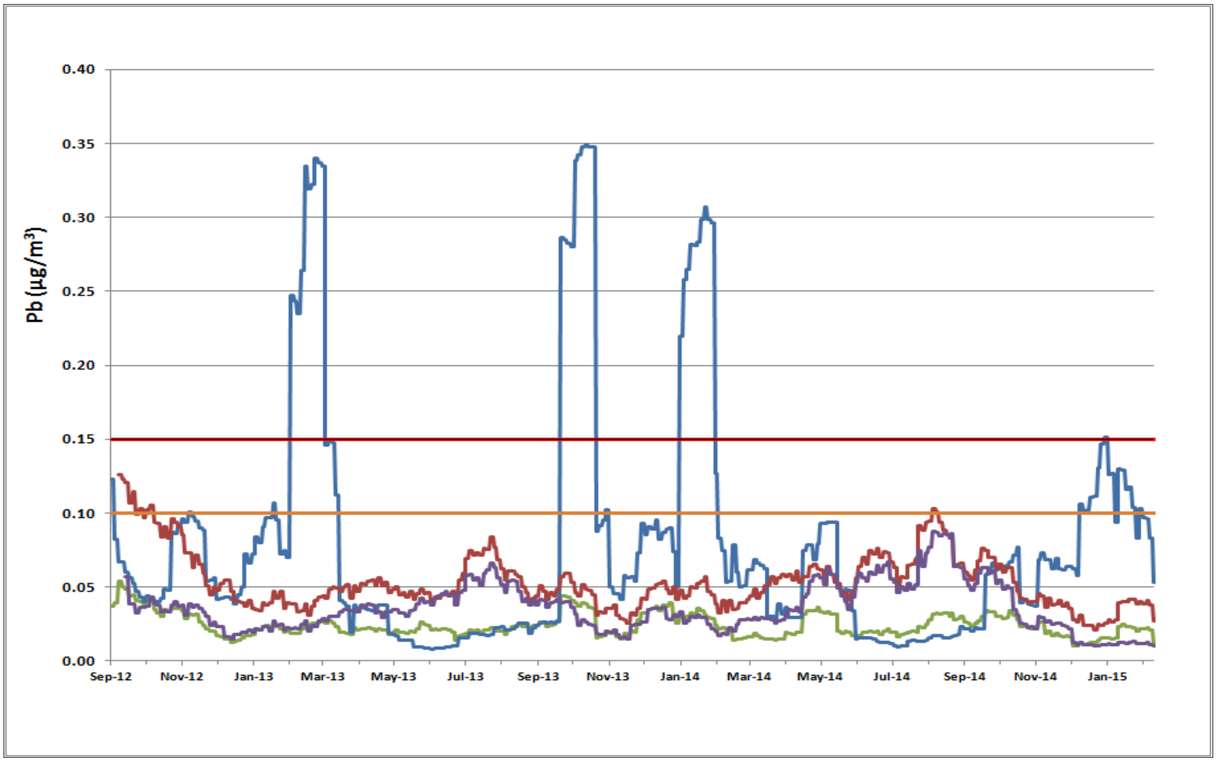


Gerdau (Fence Line and Source-Oriented Monitors – Rule 1420 & Lead NAAQS)

Gerdau North America acquired the TAMCO Rancho Cucamonga steel mini mill in October 2010. In 2012, Gerdau retained an environmental consultant to perform an environmental audit and found discrepancies in reported lead emissions. Gerdau self-reported these discrepancies and SCAQMD staff conducted inspections of the facility to address issues. Since 2010, Gerdau has worked with the SCAQMD to ensure compliance with SCAQMD regulatory requirements and has invested nearly $7 million to improve emission reductions. Gerdau also has approved permits with the SCAQMD to install a $37 million state-of-the-art evacuation system that would further improve emission reductions of lead and other metals particulates. Gerdau currently monitors lead and other metals at the facility. Four onsite monitors maintained by Gerdau operate on a 1-in-3 day sampling schedule to monitor the site for compliance with Rule 1420. These monitors are generally located at four locations along the fence line of the facility. Two additional monitors are independently operated and maintained by the SCAQMD. As demonstrated by Figure 1-4 below, the SCAQMD monitors are collocated with the Gerdau SA Recycling monitor (#1) and the Gerdau south baghouse monitor (#2). Recent results of the Gerdau monitoring efforts (Figure 1-5 below) show Gerdau as a source of lead emissions that potentially could contribute to an exceedance of the NAAQS. Fence line monitoring onsite conducted by Gerdau at one of the four monitors measuring onsite lead in air pursuant to Rule 1420 shows multiple air lead concentration readings (2012 to present)that are well above 0.150 µg/m^3 averaged over any consecutive 30 days, typically occurring during high wind events. Further, recent NAAQS modeling analysis submitted by Gerdau to SCAQMD staff demonstrates the potential for a NAAQS exceedance near the south baghouse at locations offsite, and hence in ambient air.

Figure 1-4: Gerdau Fence Line & Source-Oriented Monitors

Figure 1-5: 2012-2015 Gerdau Rule 1420 Fence Line Monitoring Data (Rolling 30-day Average)



Facilities

Based on lead emissions inventories reported to the SCAQMD Annual Emissions Reporting (AER) program for years 2010 through 2012 and information available from the SCAQMD permitting database, there are approximately 13 metal melting facilities expected to be subject to PR 1420.2. Cumulatively these facilities process more than 50,000 tons of lead annually through a combination of metal melting furnaces. These facilities manufacture a variety of products and are classified in the Standard Industrial Classification codes as listed in Table 1-1 below. The facilities range in size from small to large scale operations and include both foundries and secondary melters. Table 1-2 provides an overview of the estimated annual lead throughput and annual reported lead emissions at metal melting facilities subject to PR 1420.2.

This proposed rule would also apply to any future metal melting facilities within SCAQMD that melt at least 100 tons per year of lead.

Table 1-1: Types of Facilities Subject to PR 1420.2

NAICS Code	Facility Type	# of Facilities
Storage Battery Manufacturing (335911)	Lead-Acid Battery	1
Secondary Smelting and Alloying of Aluminum (331314)	Scrap Metal Recyclers	1
Iron and Steel Mills and Ferroalloy Manufacturing (331110)	Iron and Steel Mills	2
Other Nonferrous Metal Foundries (331529)	Other Lead Product Manufacturing	1
Other Metal Container Manufacturing Products (332439)	Metal Forging and Heat Treating	1
Sheet Metal Work Manufacturing (332322)	Metal Melting	1
All Other Miscellaneous Chemical Product and Preparation (325998)	Chemical Products	6
[redacted]		
~~SIC Code~~	~~Facility Type~~	~~# of Facilities~~
~~2819~~	~~Chemical Manufacturing~~	~~1~~
~~3312~~	~~Steel Works, Blast Furnaces, and Rolling Mills~~	~~1~~
~~3341~~	~~Secondary Smelting and Refining of Nonferrous Metals~~	~~2~~
~~3369~~	~~Nonferrous Foundries, Except Aluminum and Copper~~	~~1~~
~~3400~~	~~Fabricated Metal Products, except Machinery and Transportation Equipment~~	~~1~~
~~3444~~	~~Sheet Metal Work~~	~~1~~
~~3691~~	~~Storage Battery Production~~	~~6~~
[redacted]		

~~*Some facilities may overlap in the different types of facilities.~~

Table 1-2: PR 1420.2 Overview of Estimated Annual Lead Throughput at Metal Melting Facilities 2010-2012

Value	0 to <100 tons/year	100 to <500 tons/year	500 to <1000 tons/year	1000 tons/year or more
# of facilities based on annual lead melted (in tons/year)	None	4	3	6

INDUSTRY PROCESS DESCRIPTION, LEAD EMISSION POINTS AND CONTROL STRATEGIES

The following paragraphs provide a general overview of the manufacturing processes and emission sources for the industry source category subject to Proposed Rule 1420.2. Specifically, this Revised Draft EA provides general operation and emissions source information for iron and steel mills, secondary metal processing, foundries, and lead-acid battery storage production.

IRON AND STEEL MILLS (1 facility)

Background

Steel mini-mills are the largest scrap metal recyclers in the United States. The scrap metal originates from sources such as scrapped automobiles, demolished buildings, discarded home appliances, and manufacturing returns. Mini-mills accounted for 57 percent of the national steel production in 2006. The applicable NAICS code for this industry is 331110, Iron and Steel Mills and Ferroalloy Manufacturing. There is one facility in the Basin in this industry source category for this rulemaking. The following process description also reflects the operational characteristics at similar facilities.

Process Description

Steel is manufactured by chemical reduction of iron ore using an integrated steel manufacturing process or a direct reduction process. In conventional integrated steel manufacturing processes, iron from a blast furnace is converted to steel in a basic oxygen furnace (BOF). However, steel can also be produced using an electric arc furnace (EAF) from scrap metal. BOF is typically used for high-tonnage production of carbon steels while EAFs are used to produce carbon steels and low-tonnage specialty steels. In the BOF process, coke making and iron making precede steelmaking; these steps are not necessary with an EAF.

- Electric Arc Furnace (Metal Melting - Steel Production)
  An EAF is a cylindrical, refractory-lined container, and when electrodes are retracted from the furnace, its roof can be rotated aside to permit scrap metal charging (feeding) into the furnace. The charging material is typically scrap metal that is charged by an overhead crane. Steel production using an EAF includes stages such as charging, melting, refining, slagging, and tapping. Each of these stages are described below.

  - Charging
    During the charging stage, scrap metals are fed into the EAF. The charge can also include carbon and lime, a fluxing agent which removes chemical impurities out of the metal and renders slag that is more liquid at smelting temperatures. The slag is a liquid mixture of ash, flux, and other impurities. Direct reduced iron (DRI) or other iron-bearing material can supplement the scrap metal. DRI, also known as "sponge iron", is a type of iron created by heating iron ore to burn off carbon and oxygen while the temperature is kept below iron's melting point.

- <u>Melting</u>
  The furnace roof is rotated back to close the furnace and carbon electrodes are lowered through openings in the furnace roof. Electric current generates heat between the electrodes and through the scrap to melt the scrap. Oxy-fuel burners and oxygen lances may also be used to supply chemical energy. Oxy-fuel burners, which burn natural gas and oxygen, use convection and flame radiation to transfer heat to the scrap metal. Oxygen is directly injected through oxygen lances into the molten steel. Exothermic reaction with the iron and other components provides additional energy to assist in the melting of the scrap metal and excess carbon. Alloys may be added to achieve the desired composition.

- <u>Refining</u>
  Refining of molten steel can take place simultaneously with melting process, especially in EAF operations where oxygen is introduced. During the refining process, substances that are incompatible with iron and steel are separated out by forming a layer of slag on top of the molten metal.

- <u>Slagging</u>
  The slag layer consists primarily of oxides of calcium, iron, sulfur, silicon, phosphorus, aluminum, magnesium, and manganese in complexes of calcium silicate, aluminosilicates, and aluminoferrite. The slag is typically removed by tipping the furnace backwards and pouring the molten slag out through a slag door.

- <u>Tapping</u>
  After completion of the EAF batch process, the tap hole is opened, and the hot steel is poured from the EAF into a ladle for transfer to the next operation.

- <u>Secondary Refining</u>

  - <u>Argon Oxygen Decarburization (AOD)</u>
    AOD is a process that further refines the steel outside the EAF during the production of certain stainless and specialty steels. In the AOD process, steel from the EAF process is transferred into an AOD vessel, and gaseous mixtures containing argon and oxygen or nitrogen are blown into the vessel to reduce the carbon content of the steel. Argon assists the carbon removal by increasing the affinity of carbon for oxygen.

  - <u>Ladle Metallurgy</u>
    After initial smelting and refining of the steel in the EAF, molten steel is further refined in a ladle furnace undergoing chemical and thermal homogenization. The molten steel may receive alloy additions to produce the desired metallurgy.

- <u>Casting and Finishing</u>

  - <u>Continuous Casting</u>
    A ladle with molten steel is lifted to the top of a continuous caster, where it flows into a reservoir (called a tundish) and then into the molds of the continuous casting machine. Steel passes through the molds and then is cooled and solidified into semi-finished products such as blooms, billets, or slabs.
  - <u>Ingot Casting</u>

Molten steel is poured into an ingot mold, where it cools and begins to solidify. The molds are stripped away, and the ingots are transferred to a soaking pit or reheat furnace where they are heated to a uniform temperature. Ingots are shaped by hot rolling into the semi-finished products such as blooms, billets, or slabs, or by forging.

- Finishing
  The semi-finished products may be further processed by a number of different steps, such as annealing, hot forming, cold rolling, pickling, galvanizing, coating, or painting. Some of these steps require additional heating or reheating. The additional heating or reheating is accomplished using furnaces usually fired with natural gas.

Process Emission Points and Controls

- EAF
  During EAF steelmaking process, metal dusts and gaseous emissions are generated from charging scrap, smelting and refining, removing slag, and tapping steel. The amount and composition of the particulate matter (PM) emitted can vary greatly depending on the scrap composition and types and amount of furnace additives such as fluxes. Iron and iron oxides are the primary components of PM. In addition, zinc, chromium, nickel, lead, cadmium, and other metals may also be present in the PM. Transfer of slag removed from the EAF is a potential source of fugitive lead-dust emissions, especially when cooled slag is loaded by a front-end loader onto a truck to be transported to a different location.

  Emissions from an EAF are generally captured using direct shell evacuation supplemented with a canopy hood located above the EAF. In general, the captured gases and particulate from the EAF are routed to baghouses for PM control. Some mini-mills have a common baghouse through which emissions from the EAF, as well as emissions from the ladle metallurgy process and/or continuous caster, are ducted and subsequently controlled. Fugitive dust emissions from slag loading can be controlled by applying dust suppressants or enclosing the loading area that has openings with overlapping flaps and venting the dust-laden air to a dust collector.

- Secondary Refining
  The AOD vessel, ladle furnace and ladle heater are potential source of PM and gaseous emissions. A roof canopy hood or a side draft hood is used to capture the emissions which are vented to a baghouse (which may be the same baghouse used for EAF emissions).

- Casting and Finishing
  Fugitive particulate emissions may be generated at the caster and emitted through a roof stack. Control devices are not generally employed for these processes. Other potential sources of emissions include reheat furnace, annealing furnaces, and other furnaces used in the finishing processes.

- Fugitive Dust
  PM emissions from the processes described above can be deposited onto building surfaces and soils nearby. Events that disturb these deposits such as winds or vehicles traveling over roads (especially unpaved roads onsite) can resuspend this particulate matter back into the air. Controls can include watering and/or application of chemical stabilizers, paving, reducing vehicle speed, or other housekeeping measures.

SECONDARY METAL PROCESSING (2 facilities)

Source Description

Secondary metal processing includes recovering and reusing metal from metal-containing materials. Secondary metal processing, also known as metal scrap recycling, is a large industry that processes in the U.S. alone, 56 million tons of scrap iron and steel (including 10 million tons of scrap automobiles), 1.5 million tons of scrap copper, 2.5 million tons of scrap aluminum, 1.3 million tons of scrap lead, 300,000 tons of scrap zinc and 800,000 tons of scrap stainless steel, and smaller quantities of other metals, on a yearly basis.

The NAICS codes for this industry are 331314 Secondary Smelting and Alloying of Aluminum; 331410 Nonferrous Metal (except Aluminum) Smelting; and 331492 Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum).

Process Description

Specifics recovery processes vary depending on the type of metal being processed. Processes can also vary among facilities processing the same type of metal. However, the processes used by different industries may be grouped as described below.

- Raw Material Handling

Material handling operations include receiving, unloading, storing, and conveying the metal-containing materials and auxiliary materials required for metal processing (i.e., scrap metals, fluxes, fuels, alloys, and casting materials).

- Scrap Pretreatment

Scrap pretreatment involves the preliminary separation of the metal of interest from other metals contained in the scrap and contaminants such as dirt and plastics. The most commonly used operations include mechanical separation, solvent cleaning, centrifugation, pyrometallurgical and hydrometallurgical cleaning, and heavy-media separation. Mechanical separation includes sorting, crushing, pulverizing, shredding, and other mechanical means to break scrap into small pieces.

- Metal Melting/Smelting

Melting is performed to separate the metals of interest from their metallic compounds. Melting also allows the creation of an alloy and castings to be made from its molten metal. Smelting in metal processing takes place in furnaces or heated crucibles. The furnaces may be heated with fuels or through the use of electricity.

Pretreated scrap, fuels, and flux materials are charged to the furnace where melting takes place. The mixture of the flux materials depends on the type of metal being processed. In secondary lead processing, for example, flux materials may consist of rerun slag, scrap iron, coke, recycled dross, flue dust, and limestone. The flux may chemically react with the scrap in the presence of heat, breaking metallic-oxide bonds to produce pure metal. Also, the flux may oxidize impurities in the scrap and further purify the metal.

- Metal Refining

Refining may take place in the melting furnace, or it may be performed in holding furnaces or other heated vessels separate from the melting furnace to further purify the metal, producing the desired properties. These furnaces are heated with fuels or with electricity. Flux materials are added to the molten metal in the furnace to remove impurities. Alloy materials are added to produce desired properties of the metal.

- Metal Forming and Finishing

The metal may be formed to make bars and ingots, or it may be formed to a final product. Bars and ingots, such as those produced in secondary lead and aluminum industries, may be sent to another facility to make a final product. In iron and steel foundries, the metal is cast into a final product at the melting facility.

Forming the metal into a final product requires the use of cores and molds. Cores are shapes used to make internal voids in castings. Molds are forms used to shape the exterior of castings. Once the formed metal is removed from the mold, it may be necessary to grind or sand off rough edges. The metal may also be shot-blasted to remove mold sand or scale.

Emissions and Control

Particulate or hazardous air pollution emissions are likely to result from hot processes that produce fumes (such as torching, welding, and melting in a furnace) or processes that produce dust (such as breaking, shredding, and cutting). Exhaust systems, either stationary or portable, can capture airborne hazardous metal at the source of emissions such as melting furnaces, shredders, and cutters. Cyclones, electrostatic precipitators, and fabric filters are suitable to filter dust. Wet scrubbers are also a common control method for dust and acidic gases.

FOUNDRIES (3 facilities)

Source Description

A foundry is a facility that produces metal castings. The metal casting industry sector includes establishments that pour molten ferrous metals (iron and steel) or non-ferrous metals under high pressure into molds to manufacture castings. Ferrous metal castings include those castings made with gray iron, white iron, ductile iron, malleable iron, and steel. Non-ferrous metal castings are predominantly aluminum, but might also be bronze, brass, zinc, magnesium, and titanium. Cast metal components are used in the manufactured goods that include engine blocks, transmission housings, and suspension parts of cars and trucks; undercarriages of farms and construction equipment; and pipes and valves for plumbing fixtures and boilers. The applicable NAICS codes for this industry sector are 331511 Iron Foundries; 331512 Steel Investment Foundries; 331513 Steel Foundries (except Investment); 331523 Nonferrous Metal Die-Casting Foundries; 332524 Aluminum Foundries (except Die-Casting); and 331529 Other Nonferrous Metal Foundries (except Die-Casting).

Process Description

Foundry operations consist primarily of pattern/mold making, melting, pouring, cooling and finishing.

- Pattern and Mold Making

Pattern making is the first stage of developing a new casting. The pattern becomes permanent so it can be used to form a number of permanent molds. Cores are produced in conjunction with the pattern to form the interior surfaces of the casting. Cores are formed by one of the binding systems.

The mold is formed in a mold box (flask), which is typically constructed in two halves to assist in removing the metal product. The bottom half of the mold (the drag) is formed on a molding board. Cores require greater strength to hold their form during pouring. Once the core is inserted, the top half of the mold (the cope) is placed on top.

- Melting and Pouring
  Many foundries use a high proportion of scrap to make up a charge. The charge is weighed and introduced into the furnace. Alloys and fluxes are added to the charge to produce the desired melt. The furnaces commonly used in the industry are described below.

  Molten metal is transferred from the furnace to a ladle and held until it reaches the desired pouring temperature. The molten metal is poured into the mold and allowed to solidify.

  - Cupola Furnace
    A typical cupola furnace consists of a water-cooled vertical cylinder which is lined with refractory material. Cupolas are charged in alternating layers of scrap metal, alloying materials, limestone, and coke through an opening in the cylinder. Air is introduced into the cupola through tuyeres located at the base. The heat produced by the burning coke melts the iron, which flows down and is tapped from the bottom of the cupola. Flux combines with non-metallic impurities in the charge and forms slag, which is drawn off through holes located above the level of the metal tap hole.

  - Induction Furnace
    An induction furnace is an electric melting furnace that uses heat generated by electric induction to melt metal. These furnaces have excellent metallurgical control and are relatively pollution free in comparison to cupola furnaces. A high voltage in the primary coil induces a low-voltage, high current across the metal charge which acts as a secondary coil. Because of electrical resistance in the metal, this electrical energy is converted to heat which melts the charge. Once the metal is in its molten state, the magnetic field produces a stirring motion. In a coreless induction furnace, the refractory-lined crucible is completely surrounded by a water-cooled copper coil, which prevents the primary induction coil from overheating. In a channel induction furnace, the induction coil surrounds the inductor.

  - Electric Arc Furnace
    An EAF is another type of electric furnace used in larger foundries and mini-mills steelmaking operations. The scrap metal charge is placed on the hearth and melted by the heat from an electric arc formed between the electrodes. In a direct-arc furnace, the electric arc comes into contact with the metal; in an indirect-arc furnace, the electric arc does not touch the metal. EAFs are more tolerant of dirty scrap than induction furnaces and can be used to refine metals, allowing steel to be refined from iron charge.

  - Reverberatory Furnace
    Reverberatory furnaces are designed and operated to produce a soft, nearly pure lead product. Reverberatory furnaces emit high levels of lead fume during charging and tapping lead and slag.

- <u>Rotating Furnace</u>
  A rotating furnace consists of a refractory-lined cylinder that rotates slowly around a horizontal axis. The charge is heated directly from an open flame, typically fed by gas or oil. Exhaust gases are extracted from the opposite end of the chamber. Rotating the furnace helps to mix the charge and utilizes heat from the whole refractory surface.

- <u>Crucible Furnace</u>
  Crucible furnaces are mostly used by smaller foundries or for specialty alloy lines. The crucible or refractory container is heated in a furnace, typically fired with natural gas or liquid propane.

- <u>Cooling and Shakeout</u>
  Once the metal has been poured, the mold is transported to a cooling area. The casting needs to cool before it can be removed from the mold. Castings may be removed manually or using vibratory tables that shake the refractory material away from the casting. Quenching baths are also used in some foundries to achieve rapid cooling of castings. The quench bath may contain chemical additives to prevent oxidation.

- <u>Sand Reclamation</u>
  A significant proportion of the waste sand is reclaimed mechanically or thermally for reuse. Cores, metal lumps, and binders are removed by vibrating screens and extraction, and collected in a baghouse. Thermal reclamation process heats the sand to the point where organic materials, including the binders, are driven off. The sand is returned to an "as new" state, allowing it to be used in core making.

- <u>Finishing</u>
  Finishing processes such as fettling involves the removal of the casting from the gating systems. This is accomplished by cutting, grinding, and chiseling.

<u>**Emissions and Control**</u>

Air emissions result from various operations in foundries, including metal melting, mold making, handling foundry sand, and die-casting. A substantial amount of metal emissions come from the metal melting operations, while most organic emissions are from handling the binder. Once the binder is combined with the sand, there may be additional PM emissions from pouring the molten metal into the casting and from breaking apart the cast. Handling foundry sand results primarily in PM emissions. Fugitive particulate can be emitted from operations of unloading, storage, transfer, and preparation.

The casting or mold pouring and cooling operations in iron and steel foundries are potentially a source of lead emissions due to impurities in the metal. In addition, mold preparation and casting shakeout (removal from the mold) activities are also lead emission sources.

Baghouses and wet scrubbers are common technologies used to control lead emissions from foundry metal melting operations. Fugitive emissions from such sources are generally controlled with local hooding or building ventilation systems that are ducted to a control device (predominantly baghouses).

STORAGE BATTERY MANUFACTURING (7 facilities)

Source Description

A major use of lead is in lead-acid storage batteries. The electrical systems of vehicles, ships, and aircraft depend on such batteries for start-up, lighting, and ignition and, in some cases, batteries provide the actual motive power. The NAICS code for this industry sector is 335911 Storage Battery Manufacturing.

Process Description

Operations consist primarily of grid casting, paste mixing, pasting, burning, battery assembly, formation and lead recovery.

- Grid Casting

  Lead alloy ingots are melted in a gas-fired lead furnace at approximately 700 degrees F. The furnace is often equipped with a hood to vent the fumes to an emission control device. The molten lead flows into molds that form the battery grids. They are then ejected, trimmed, and stacked.

- Lead Oxide Production and Paste Mixing

  The paste mixing is conducted in a batch-type process to make paste for application to the grids. A mixture of lead oxide powder, water, sulfuric acid, and an organic expander (generally mixture of barium sulfate, carbon black, and organic fibers) are added to the mixer, depending on whether the paste batch is for positive or negative plates. The mixture is blended to form a stiff paste. A duct system vents the exhaust gases from the mixer and loading station to an emission control device.

- Grid Pasting

  Pasting machines force the lead sulfate paste into the interstices of the grid structure (the grids are called plates after the paste has been applied). The freshly pasted plates are transported through a temperature-controlled heated tunnel, where the surface water is removed. The floor area around pasting operations must be kept clean of paste, however, since this is a potential source of fugitive dust. After the plates are cured for up to 72 hours, they are sent to the assembly operations where they are stacked in an alternative positive and negative block formation.

- Lead Burning

  Leads are welded to the tabs of each positive plate and each negative plate, fastening the assembly (element) together. An alternative to this operation is the “cast-on-strap” process, where molten lead is poured around and between the plate tabs to form the connection. Then a positive and a negative tab are independently welded to the element. The completed elements can go to either the wet or dry assembly lines.

- Battery Assembly

  In the wet battery line, elements are placed in battery cases made of durable plastic or hard rubber. Covers are sealed to the cases, and the batteries are filled with diluted sulfuric acid and made ready for formation. For dry batteries, elements are formed prior to being placed in a sealed case.

- Formation

The inactive lead oxide-sulfate paste is chemically converted into an active electrode. Lead oxide in the positive plates is oxidized to lead peroxide; in the negative plates, it is reduced to metallic lead. This is accompanied by placing the unformed plates in a diluted sulfuric acid solution and connecting the positive plates to the positive pole of a direct current (D.C.) source and the negative plates to the negative pole of a D.C. source.

- Lead Recovery

Defective parts are either reclaimed at the battery plant or sent to a secondary lead melter for recycling. Pot-type furnaces are generally used for reclaiming scrap lead at the battery manufacturing plants. Emissions generally are visible only when oily scrap or floor sweepings are charged.

Emissions and Control

Lead and other PM are generated in several operations within storage battery production. Fabric filtration in baghouses is generally used as part of the process control (i.e., product recovery equipment) and to collect particulate emissions from lead oxide mills. Fabric filters have become an accepted method for controlling emissions from grid casting and lead reclamation. Specifically, cartridge collectors and high efficiency particulate air (HEPA) filters can be used in grid casting, paste mixing, lead oxide manufacturing, the three-process operation, or lead reclamation. Cyclone mechanical collectors often precede fabric filters.

PROJECT DESCRIPTION

The following is a summary of the PR 1420.2 – Emission Standards for Melting Facilities. A copy of PR 1420.2 with the specific details of the rule language can be found in Appendix A. Since the June version of PR1420.2, SCAQMD staff has been working with stakeholders and has revised some of the provisions. The approach and core provisions requiring ambient monitoring of lead, the ambient lead concentration limits, lead point source requirements, requirements for operating within an enclosure, housekeeping and maintenance, and requirements for a compliance plan if certain thresholds are exceeded have not changed. In general, the revisions provided clarifications, provided other compliance options, or reduced the frequency of implementing specific provisions. As discussed in Chapter 2, modifications to the proposed rule will not increase or create any new environmental impacts and in areas where the frequency of implementing certain housekeeping measures is allowed, will lessen certain environmental impacts.

Applicability

PR 1420.2 applies to metal melting facilities in the SCAQMD that melt 100 tons or more of lead annually. Based on SCAQMD staff analysis of compliance and permitting data (including AER, permit files, available source tests, and available ambient air monitoring data), there are currently 13 facilities in the Basin that meet the applicability of the proposed rule. These facilities represent high lead emissions from the stationary source category of reported lead emissions in the Basin and include facilities such as scrap recyclers, iron and steel mini-mills, aerospace, and lead-acid battery manufacturers. Additionally, as discussed in Chapter 1, data from SCAQMD monitors at two metal melting facilities have shown the potential for this source category to exceed the NAAQS lead limit of 0.15 µg/m^3 averaged over a rolling 3-month period. A minimum process limit of 100 tons of lead melted a year was set as the threshold for rule applicability because a facility melting a little over this amount resulted in high ambient air lead concentrations at the fence line. PR 1420.2 is more stringent than Rule 1420, therefore facilities that are subject to PR 1420.2 would be exempt from Rule 1420 requirements.

Definitions

PR 1420.2 includes definitions of the following terms used in the proposed rule. Please refer to subdivision (c) [Definitions] of PR 1420.2 for the definitions:

- Ambient Air
- Casting
- Duct Section
- Dust Suppressant
- Emission Collection System
- Emission Control Device
- Fugitive Lead-Dust
- Furnace
- Furnace, Refining, or Casting Area
- Lead
- Leeward Wall
- Maintenance Activity
- Measurable Precipitation
- Metal
- Metal Melting Facility
- Partial Enclosure
- Point Source

- Process
- ~~Sensitive Receptor~~
- Slag
- Smelting
- Smelting Furnace
- Total Enclosure
- Windward Wall

Requirements

Subdivisions (d) through (l) of PR 1420.2 establish key "core" requirements including ambient air lead concentration limits, ambient air monitoring and sampling, point source emissions controls, total enclosures, housekeeping measures, maintenance activity requirements, source testing, recordkeeping, and reporting. Requirements for submitting and implementing a Compliance Plan are specified in subdivision (m) [Compliance Plan] and subdivision (o) [Exemptions] includes exemptions.

Subdivision (d) – Ambient Air Lead Concentration Limit

Upon adoption of PR 1420.2 until March 31, 2018, metal melting facilities with an approved ambient air monitoring plan will be required to meet an ambient air lead concentration limit of 0.150 µg/m^3 averaged over any 30 consecutive days. For metal melting facilities that install a rule-required ambient air lead monitor after adoption of Rule 1420.2, the ambient lead concentration limit of 0.150 µg/m^3 averaged over any 30 consecutive days must be met beginning 90 days from the date the ambient air monitoring plan is approved. The 90 days provides a 30-day time period after the ambient monitors are required to be installed before the 0.150 µg/m^3 lead concentration limit is effective.

On and after ~~January~~ April 1, 2018, metal melting facilities subject to PR 1420.2 will not be allowed to discharge into the atmosphere emissions which contribute to ambient air concentrations of lead that exceed 0.100 µg/m^3 averaged over any 30 consecutive days. Measurements recorded at any rule-required ambient air lead monitor, including any District-installed monitor, must meet the rule limit.

The objective of the proposed requirement is to be protective of public health by limiting the lead concentration in the ambient air. By limiting the ambient air lead concentration to 0.100 µg/m^3 by 2018, it will further reduce the accumulation of lead dust and reduce lead exposure from metal melting facilities to the surrounding community. In the most recent EPA review of the National Ambient Air Quality Standards for Lead[1], EPA decided to retain the current standard. However, lowering the ambient air lead concentration is consistent with studies that U.S. EPA reviewed indicating that lower ambient air lead concentrations would result in fewer impacts to children. According to U.S. EPA, the assessment of the currently available studies continues to recognize a non-linear relationship between blood lead and effects on cognitive function, with a greater incremental effect (greater slope) at lower relative to higher blood lead levels.[2] Chronic health effects include increased risk of cancer, nervous and reproductive system disorders, neurological

[1] EPA Review of the National Ambient Air Quality Standards for Lead; http://www.epa.gov/airquality/lead/actions.html#dec2014

[2] U.S. EPA's "Policy Assessment for the Review of the Lead National Ambient Air Quality Standards," Environmental Protection Agency, May 2014

and respiratory damage, cognitive and behavioral changes, and hypertension. In addition, young children accumulate lead more readily than adults and they are more vulnerable to certain biological effects of lead including learning disabilities, behavioral problems, and deficits in IQ.

Subdivision (e) – Ambient Air Monitoring and Sampling Requirements

PR 1420.2 facilities will be required to collect and analyze ambient air lead samples to determine compliance with the ambient air quality lead concentration limits of the rule. This subdivision provides the requirements for submittal of an ambient air monitoring plan, which includes the number of monitors, placement of monitors, and installation of monitors.

PR 1420.2 requires that 24-hour lead samples be collected and requires that samples be collected midnight-to-midnight at all sites, but does allow for a different sampling schedule based on approval of the Executive Officer. Refer to PR 1420.2 for more details. Facilities will also be required to continuously monitor wind speed and direction for the ambient air quality monitoring system at all times to supplement data analysis of samples collected. Only personnel approved by the Executive Officer will be allowed to conduct ambient air quality monitoring, and sampling equipment shall be operated and maintained in accordance with U.S. EPA-referenced methods. A provision was added to PR 1420.2 which provides a process where an operator can submit information to the Executive Officer when there operator has information that an alleged source is the primary cause of an exceedance.

Cleaning activities, such as wet washing and misting, that result in damage or biases to samples collected, will not be allowed within 10 meters of any sampling site required by the rule. Additionally, ambient air quality monitoring systems that are required to conduct daily samples will be required to be equipped with a backup, uninterruptible power supply sufficient to power monitors for use during a power outage. This requirement will not be required during the first year of monitoring. Any existing ambient air monitoring network currently in use for Rule 1420 can be used for compliance with PR 1420.2 so long as all rule requirements for sampling and monitoring have been met.

Subdivision (f) – Point Source Emission Controls

Point sources are defined by the proposed rule as any process, equipment, or total enclosure used at a melting facility whose emissions pass through a stack or vent designed to direct or control its release into the ambient air. All lead emissions from lead point sources are required to be vented to a lead control device. Proposed requirements for lead point source emission controls will be effective beginning March 1, 2016.

PR 1420.2 requires that lead point source emission controls meet a minimum lead reduction efficiency of 99 percent. The 99 percent lead reduction efficiency is more stringent than the 98 percent lead reduction efficiency requirement of Rule 1420. Upon review of SCAQMD-approved source tests of lead point sources, SCAQMD staff determined that the more stringent 99 percent lead reduction efficiency for this source category was achievable with controls available today.

PR 1420.2 previously allowsed the owner or operator of a lead melting facility, after an initial lead reduction efficiency testing, -to demonstrate that lead point source emission rate is less than 0.080 pounds per hour in lieu of demonstrating the 99 percent lead reduction efficiency after the first year of implementation. PR 1420.2 has since been modified to still allow a facility, after initial lead reduction efficiency testing, to test the mass lead outlet emission rate. However instead of establishing a specific emission rate of 0.080 pounds per hour, the operator would use the total mass lead outlet emission rate requisite to achieve 99% control efficiency (as calculated using the most recent District-approved source test conducted at the inlet and outlet of the lead emission control device) to determine compliance with the 99% control efficiency requirement. In addition, a provision was added that will allow a facility, even during initial testing to demonstrate an outlet mass lead emission rate less than 0.0003 pounds per hour. ~~The 0.080 pounds per hour is representative of a level of lead emissions that would require the facility to install additional controls. In 2008, the U.S. EPA determined that a facility lead emissions (point source and fugitives) of 0.5 tons per year represent an estimate of the lowest lead emission rate that could result in lead concentrations exceeding the 0.15 μg/m^3 NAAQS for lead. Assuming an operation schedule of 24 hours/day, 365 days/year to arrive at an hourly lead emission rate from the facility of 0.114 pound/hour. As PR 1420.2 proposes a final ambient air lead concentration limit of 0.100 μg/m^3 averaged over 30 consecutive days, the 0.114 pound/hour lead emission rate threshold was scaled down proportionately resulting in an emission rate limit of 0.080 pounds/hour.~~

All filters and filter bags used in any lead control device are required to be rated by the manufacturer to achieve a minimum of 99.97% capture efficiency for 0.3 micron particles, or made of polytetrafluoroethylene membrane material. Any other material that is equally or more effective for the control of lead emissions may be used if approved by the Executive Officer.

Subdivision (g) – Total Enclosures

No later than March 1, 2016, the specified areas below will be required to be located within a total enclosure. The areas may be enclosed individually or in groups. The intent of this requirement is to minimize fugitive lead-dust emissions generated in processing areas, specifically:

- Furnace, refining, or casting areas; and
- Lead oxide production areas.

Cross-draft conditions of a total enclosure that decrease the efficacy of the emission collection system for any lead point emission source shall be minimized by closing any openings including, but not limited to, vents, windows, passages, doorways, bay doors, and roll-ups during metal melting operations. The proposed rule allows a facility to close openings when not in use, use automatic roll-up doors, vestibules, and plastic strip curtains to meet this requirement.

Total enclosures around the above mentioned areas with negative air pressure will be required for facilities with a Health Risk Assessment (HRA) approved by SCAQMD after January 1, 2015 that exceeds the action risk level specified in Rule 1402 or if the ambient air monitors indicate a concentration of more than 0.120 μg/m^3 averaged over any 30 consecutive days.

Subdivision (h) – Housekeeping Requirements

The following housekeeping requirements are proposed to minimize fugitive lead-dust emissions. All requirements will be effective within 30 days of rule adoption with the exception of the requirement to pave, concrete, asphalt, or otherwise stabilize all facility grounds, which will be effective 180 days after rule adoption.

- Clean by wet wash or clean by vacuum particles in a manner that does not generate fugitive lead-dust, the following areas at the specified frequencies, unless located within a total enclosure vented to a lead emission control device. Days with measurable precipitation in the following areas occurring within the timeframe of a required cleaning frequency may be counted as a cleaning.

- o Quarterly cleanings, no more than 3 months apart, of roof tops on structures ≤ 45 feet in height that house areas that are associated with the storage, handling or processing of lead-containing materials, excluding areas associated with the storage of raw, unprocessed lead-containing material that does not generate fugitive lead-dust;
- o Semi-annual cleanings, no more than 6 calendar months apart, of roof tops on structures > 45 feet in height that house areas associated with the storage, handling or processing of lead-containing materials, excluding areas associated with the storage of raw, unprocessed lead-containing material that does not generate fugitive lead-dust;
- o Weekly cleanings of all areas where lead-containing wastes generated from housekeeping activities are stored, disposed of, recovered or recycled; and
- o Initiate immediate cleaning, no later than one hour after any maintenance activity or event including, but not limited to, accidents, process upsets, or equipment malfunction, that causes deposition of fugitive lead-dust onto specified areas in the rule. If the facility can demonstrate that delays were due to unreasonable risks to safety posed by each cleaning or inability to reasonably obtain equipment required to implement this requirement, immediate cleanings of rooftops shall be completed within 72 hours.

- Paving, concreting, asphalting all facility grounds, or use of dust suppressants, for the purpose of providing a surface that accommodates ease of cleaning. A provision has been added that facility grounds that cannot be paved or otherwise stabilized with dust suppressants due to requirements to comply with city or other municipal permits or ordinances, requirements of the State Water Control Board, or any other state or federal agency requirement are not required to pave those areas.
- Removal of weather caps on any stack that is a lead emissions source.
- Storage of all materials capable of generating any amount of fugitive lead-dust in sealed, leak-proof containers, unless located within a total enclosure. Examples of materials include slag, spent filters used in lead control devices, and lead-containing waste generated from housekeeping requirements. A provision has been added that allows use of dust suppressants as approved by the Executive Officer.
- Transport of all materials capable of generating any amount of fugitive lead-dust emissions within closed conveyor systems or in sealed, leak-proof containers, unless conducted within a total enclosure. This requirement is not applicable to the transport of high temperature material where implementation of the specified control requirements are infeasible. A provision has been added that allows use of dust suppressants as approved by the Executive Officer.
- Facility grounds cleaning using onsite wet scrubbers or mobile vacuum sweepers or vacuums equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron particles. Facilities will be required to wet scrub or vacuum sweep all facility areas subject to vehicle and foot traffic with a wet scrubber or vacuum or an onsite mobile vacuum sweeper that complies with District Rule 1186. Wet scrubbing or ~~V~~vacuum sweeping will be required at least once per operating shift, when lead processing is occurring.
- Post signs at all entrances and truck loading and unloading areas indicating a speed limit of 5 miles per hour on any roadway located within 75 feet of the perimeter of a total enclosure and 15 miles per hour or less on any roadway located at more than 75 feet from the perimeter of a total enclosure.

- For each of the housekeeping measures identified above, the proposed rule allows an alternative housekeeping measure be used provided the owner or operator demonstrates and receives written approval from the Executive Officer.

Additionally, any accidents, mishaps and/or process upsets occurring in the aforementioned areas that result in the deposition of lead-containing material or dust shall be vacuum swept immediately, no later than one hour after occurrence. Further, sweeping will not be required on any day where the onsite measured rain amount is greater than 0.01 inches in any 24-hour calendar day. Facilities may use locally recorded and reported measured rain amounts. In addition, a provision has been added to PR 1420.2 which will allow an operator to submit an alternative housekeeping requirement provided it meets the same objective and efficiency as the measure it is replacing (as described in Appendix 3 of PR 1420.2).

Subdivision (i) – Maintenance Activity Requirements

The maintenance activity requirements of PR 1420.2 are effective upon rule adoption. For purposes of the proposed rule, maintenance activity is defined as any of the following activities conducted outside of a total enclosure that generates fugitive lead-dust:

- Building construction, demolition, or the altering of a building or permanent structure, or the removal of one or more of its components that generates fugitive lead-dust;
- Replacement or repair of refractory, filter bags, or any internal or external part of equipment used to process, handle, or control lead-containing materials;
- Replacement of any duct section used to convey lead-containing exhaust;
- Metal cutting or welding that penetrates the metal structure of any equipment used to process lead-containing material, and its associated components, such that lead dust within the internal structure or its components can become fugitive lead-dust;
- Resurfacing, repair, or removal of ground, pavement, concrete, or asphalt; or
- Soil disturbances, including but not limited to, soil sampling, soil remediation, or activities where soil is moved, removed, and/or stored.

The owner or operator of a metal melting facility will be required to conduct any maintenance activity that is not done in a total enclosure, inside a temporary negative air containment enclosure that is vented to a permitted negative air machine equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron particles. The negative air containment shall enclose all affected areas where the potential for fugitive lead-dust generation exists. If the maintenance activity cannot be conducted in a negative air containment enclosure due to physical constraints, limited accessibility, or safety issues when constructing or operating the enclosure, the facility will be required to conduct the activity under the following conditions:

- In a partial enclosure, barring conditions posing physical constraints, limited accessibility, or safety issues;
- Using wet suppression or a vacuum equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron particles, at locations where the potential to generate fugitive lead-dust exists prior to conducting and upon completion of the maintenance activity. Wet suppression or vacuuming will also be required during the maintenance activity barring safety issues;
- While collecting 24-hour samples at monitors for every day that maintenance activity is occurring notwithstanding paragraphs (e)(2) through (e)(5) of the rule. For unplanned maintenance activity, if sampling is not being conducted on the day the incident occurs, sample collection shall begin at midnight at the end of the day on which the incident occurs;

- Maintenance activity conducted outside a negative enclosure must stop immediately if instantaneous wind speeds are 20 miles per hour or greater. Maintenance work may be continued if it is necessary to prevent the release of lead emissions;
- All concrete or asphalt cutting or drilling performed outside of a total enclosure shall be performed under 100% wet conditions; and
- Grading of soil shall only be performed on soils sufficiently wet to prevent fugitive dust.

All lead-contaminated equipment and materials used for any maintenance activity requires immediate storage or cleaning after completion of work, by wet wash or a vacuum equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron particles. Storage and cleaning must be done in a manner that does not generate fugitive lead-dust.

Subdivision (j) – Source Tests

The proposed rule will require annual source tests for all lead control devices in order to demonstrate compliance with the lead control reduction efficient for any lead point source emission control of 99%. Initial source tests for new and modified lead control devices with an initial start-up date on or after the adoption date of the proposed rule will be required within 60 days of initial start-up. Existing lead control devices in operation before the adoption date of the rule will require a source test no later than six months after adoption of the rule. An existing source test, for existing lead control devices, conducted on or after January 1, 2014 may be used as the initial source test as long as the test:

- Is the most recent conducted since January 1, 2014;
- Demonstrated compliance with the applicable control standard;
- Is representative of the method to control emissions currently in use; and
- Was conducted using applicable and approved test methods.

The rule lists the following applicable test methods:

- SCAQMD Method 12.1;
- ARB Methods 12 and 436; and
- EPA Method 12.

Use of an alternative or equivalent test method will be allowed as long as it is approved in writing by the Executive Officer, in addition to the California Air Resources Board, or the U.S. EPA, as applicable. Facilities will be required to submit a pre-test protocol to the Executive Officer at least 60 calendar days prior to conducting the source test. Notification to the Executive Officer in writing shall also be required one week prior to conducting the source test.

The proposed rule provides an incentive for lead control devices that demonstrate low lead emission rate source test results. If an annual source test to demonstrate compliance with the lead point source emission standards of subdivision (f) demonstrates a 99% or greater reduction of lead emissions, and total facility mass lead emissions of less than 0.020 pounds per hour, then the next test for all lead point sources can be performed no later than 24 months after the date of the most recent test.

Subdivision (k) – Recordkeeping

PR 1420.2 will require records indicating amounts of lead-containing material melted at the facilities to be maintained by the facility. Examples of records include purchase records, usage records, results of lead content analysis, or other SCAQMD-approved verification to indicate melting amounts. Records for all rule-required housekeeping, maintenance activity, ambient air lead monitoring, and lead control device inspection and maintenance must also be maintained. All records shall be maintained for five years and maintained onsite for at least two years.

Subdivision (l) – Ambient Air Monitoring Reports

Under the proposed rule, facilities will be required to submit reports for monthly ambient air monitoring results for lead and wind data measured at each sampling location on a monthly basis. Beginning no later than 30 days after receiving Executive Officer approval of a Lead Ambient Air Monitoring and Sampling Plan, reports must be submitted by the 15^{th} of each month for the preceding month, and must include the results of individual 24-hour samples and 30-day averages for each day within the reporting period. Facilities that are conducting ambient air monitoring and sampling already approved by the Executive Officer and that meets the requirements in paragraph (e)(3), shall begin reporting no later than 30 days after rule adoption. In addition, any exceedance of the ambient air quality concentration shall be reported to the Executive Officer (1-800-CUT-SMOG) within 24 hours of receipt of completed sample analysis, followed by a written report to the Executive Officer no later than three business days after the notification.

Subdivision (m) – Compliance Plan

Compliance with PR 1420.2 is primarily based on an ambient air concentration of lead at fence line monitors. The proposed rule is designed to control lead point source emissions and fugitive lead-dust emissions to achieve the ambient air concentration limits. Under PR 1420.2, an owner or operator of a metal melting facility is required to submit a Compliance Plan if one or more of the following occurs:

- the point source emission rate for all lead sources is greater than 0.080 pound per hour on and after July 1, 2016; or
- the ambient air lead concentration is greater than 0.120 µg/m^3 averaged over 30 consecutive days on and after July 1, 2016; or
- the ambient lead concentration is greater than 0.100 µg/m^3 averaged over 30 consecutive days on and after ~~January~~ <u>April</u> 1, 2018.

The purpose of this provision is to address any facilities that still may have difficulty demonstrating compliance with the ambient air lead concentration limit even after implementation of PR 1420.2 core requirements. The Compliance Plan will identify additional measures to be implemented and at a minimum, each Compliance Plan submittal shall include:

- A ~~comprehensive~~ list of additional short-term and long-term lead emission reduction measures to be implemented <u>to address any reasonably foreseeable exceedance and to ensure compliance with the applicable ambient lead concentration limit</u>~~in the event that ambient concentrations of lead exceed 0.100 µg/m^3 averaged over any 30 consecutive days~~. Additional lead emission reduction measures <u>should address the areas where there are sources that contributed to an ambient lead concentration greater than 0.070 µg/m^3 and should address the following areas as applicable:</u>~~must include, but are not limited to:~~
    - Increased frequency of housekeeping measures such are more frequent sweeping, roof washing, etc.;
    - More stringent housekeeping measures, such as installation and maintenance of vehicle wet wash areas, additional areas for cleaning;
    - Total enclosures with negative air pursuant to the requirements in Appendix A of PR 1420.2;

- Modification to lead point source control devices, including but not limited to process and/or operational changes, and enhanced maintenance of lead point source control devices to increase the capture and/or control efficiency;
- Installation of multi-stage lead emission control devices , including but not limited to devices that use filter media other than a filter bag(s), such as HEPA and cartridge-type filters rated by the manufacturer to achieve a minimum of 99.97% control efficiency for 0.3 micron particles;
- Process changes including reduced throughput limits;
- Conditional curtailments including, at a minimum, information specifying the curtailed processes, process amounts, and length of curtailment; and
- Identification of lead reduction measures to be implemented relative to increasing ranges of exceedance levels of the ambient air concentration limit. The owner or operator is required to identify initial measures necessary to achieve the ambient air lead concentration of 0.100 μg/m^3 averaged over any 30 consecutive days as well as additional measures to be implemented in the event that subsequent exceedences of the 0.100 μg/m^3 averaged over any 30 consecutive days.

It should be noted that ~~although the owner or operator is required to identify all~~ the control measures listed above in the Compliance Plan, ~~it~~ will ~~not always be the case where a facility would be required to~~ be implemented only if the facility exceeds the triggers for implementing the compliance plan and it would only include those measures needed to address the exceedance.~~all measure listed based on the severity and conditions surrounding the ambient air concentration or total facility mass emission rate exceedance.~~ The owner or operator shall implement measures based on the schedule in the approved Compliance Plan if lead emissions discharged from the facility contribute to ambient air concentrations of lead to exceed:

- 0.150 μg/m^3 averaged over any 30 consecutive days on or after January 1, 2017, measured at any monitor pursuant to subdivision (e) or at any District-installed monitor; or
- Three exceedances of 0.100 μg/m^3 averaged over any 30 consecutive days over a rolling 24-month period on or after ~~January~~ April 1, 2018, measured at any monitor pursuant to subdivision (e) or at any District-installed monitor.

Under Proposed Rule 1420.2, the owner or operator is required to specify the implementation schedule and categorize the measures based on the source and prioritize~~ation of~~ each lead emission reduction measure based on how quickly the measure can be implemented. ~~As specified in paragraph (m)(5) in the rule, the prioritization of lead emission reduction measures should be in order from the highest to the lowest potential lead emissions reductions.~~ In some situations, there may be a need if there are subsequent exceedances of the ambient air concentration limits to implement lead emission reduction measures prior to the completion of implementation of initial measures. If there is information that implementation of initial measures will not ensure that a subsequent exceedance of the applicable ambient concentration limit ~~of 0.100 μg/m^3 averaged over any 30 consecutive days~~ will not occur, the Executive Officer may require that lead emission reduction measures be implemented prior to completion of implementation of initial measure(s).

In specific situations where the total facility lead point source emission rate, as determined through a source test, is greater than 0.080 pound per hour, measures to reduce lead point source emissions must be implemented first. Please refer to subdivision (m) [Compliance Plan] for more details regarding the implementation schedule for lead reduction measures, updating a Compliance Plan, and other requirements.

Subdivision (n) – Visible Emissions

Under PR 1420.2, facilities are not to discharge into the atmosphere fugitive lead-dust emissions that exceed Ringlemann 0.5, or 10 percent opacity, for more than three minutes aggregate in any 60-minute period. This is a current requirement of Rule 1420 and is being required in PR 1420.2 since facilities subject to PR 1420.2 will be exempt from Rule 1420.

Subdivision (~~n~~o) – Exemptions

PR 1420.2 provides exemptions to the ambient air monitoring requirements if the following are met and the Executive Officer approves an air monitoring exemption plan containing the following:

- Air dispersion modeling analysis that demonstrates an operational ambient air lead concentration of < 0.070 μg/m^3 averaged over 30 consecutive days.
- One (1) year of ambient air monitoring data without a single day exceeding an ambient air lead concentration of 0.070 μg/m^3 averaged over 30 consecutive days. This demonstration period is only applicable to the first year of operating a District-approved ambient air monitoring and sampling network that complies with subdivision (e) [Ambient Air Monitoring Requirements].
- The facility's most recent source tests approved by the District demonstrate a total facility mass lead emission rate from all lead point sources of less than 0.040 pounds per hour.

Any violation of the ambient air lead concentration limits required by subdivision (d) [Ambient Air Lead Concentration Limit] or any lead throughput increase of five (5) percent or more above recent source test levels conducted pursuant to subdivision (k) [Recordkeeping] shall result in revocation of the air monitoring relief plan. Upon revocation of the air monitoring relief plan, the owner or operator of a metal melting facility shall comply with the requirements of subdivision (e) [Ambient Air Monitoring Requirements] no later than 180 days after revocation of the air monitoring relief plan.

Paragraph (~~n~~o)(2) of PR 1420.2 ~~exempts~~ relives facilities with any lead point source that has an uncontrolled emission rate of 0.005 pound per hour from subdivision (f) [Lead Point Source Emission Controls] provided a source test pursuant to subdivision (j) is conducted for the lead point source at least once every 24 months.

Paragraph (~~n~~o)(3) exempts facilities from PR 1420.2 that reduce their lead melting amounts to less than 50 tons per year based on lead melting limits specified in a facility permit condition. Further, paragraph (n)(4) exempts any metal melting facility subject to the PR 1420.2 from the requirements of Rule 1420. PR 1420.2 is more stringent that the requirements of Rule 1420 and effectively supersedes the requirements set forth in Rule 1420.

Appendix 1 – Total Enclosures with Negative Air (Conditional Requirement)

Appendix 1 to the rule specifies the requirements for total enclosures with negative air that are required to be included in the Compliance Plan. As specified in Appendix A of PR 1420.2, areas with a total ground surface area of 10,000 square feet or more require a minimum of three digital differential pressure monitors: one at the leeward wall of the total enclosure, one at the windward wall, and one at an exterior wall that connects the leeward and windward wall at a location defined by the intersection of a perpendicular line between this wall and a straight line between the other two monitors in order to account for shifts in draft direction throughout the enclosure. Each total enclosure is required to be maintained at a negative pressure of at least 0.02 mm of Hg (0.011 inches H_2O) averaged over any 15 minutes and an in-draft velocity of at least ~~300~~ 200 feet per minute at any opening such as vents, windows, passages, doorways, bay doors, and roll-ups. For smaller enclosures, at least one differential pressure monitor, continuously measuring the negative pressure of the total enclosure, is required to be installed on the leeward wall.

Digital differential pressure monitors must be capable of measuring and displaying negative pressure in the range of 0.01 to 0.2 mm Hg (0.005 to 0.11 inches H_2O) with a minimum increment of measurement of plus or minus 0.001 mm Hg (0.0005 inches H_2O). Digital differential pressure monitoring systems will also need to be equipped with a continuous strip chart recorder or electronic recorder approved by the Executive Officer. If the facility elects to use an electronic recorder, the recorder will need to be capable of writing data on a medium that is secure and tamper-proof. The recorded data needs to be readily accessible upon request by the Executive Officer. If software is required to access the recorded data that is not readily available to the Executive Officer, a copy of the software, and all subsequent revisions, shall be provided to the Executive Officer at no cost. If a device is needed to retrieve and provide a copy of such recorded data, the device must be maintained and operated at the facility.

Digital differential pressure monitoring systems shall be calibrated in accordance with manufacturer's specifications at least once every 12 calendar months, or more frequently, if recommended by the manufacturer, and equipped with a backup, uninterruptible power supply to ensure continuous operation of the monitoring system during a power outage.

Appendix 2 – Periodic Smoke Test

Appendix 2 to the rule specifies the requirements for facilities to conduct periodic smoke tests in order to demonstrate that all lead emissions are being vented to the emission collection system for any lead control device subject to the rule. The periodic smoke test requirement of PR 1420.2 will not be required if performing such test presents an unreasonable risk to safety.

Appendix 3 –Objectives of Housekeeping Requirements Set-Forth in Paragraph (h)

Appendix 3 to the rule lists the objectives and effectiveness of the housekeeping measures in Subdivision (h), which will be used by an operator when submitting an alternative housekeeping requirement to ensure that it meets the same objective and efficiency as the measure it is replacing.

Emissions Control Technologies

Existing Controls

The facilities subject to PR 1420.2 are metal melting operations where lead-containing scrap or ingots are processed to recover desired metals or produce lead-containing products. The process generally involves the sorting, charging, melting, casting, and refining of lead-containing materials. Lead, arsenic and other toxic or criteria pollutant emissions are vented directly to air pollution control equipment, captured in building enclosures vented to air pollution control equipment, or are fugitive emissions that do not get captured by air pollution control equipment and come into contact with ambient air.

All of these existing facilities use baghouses or filter systems to control lead emissions from process operations and building enclosures. Since all facilities that would be subject to the proposed rule already have control devices constructed capable of meeting the point source pollution control requirements in the rule, it is assumed that facilities may install additional control devices in series as part of the compliance plan, should one be triggered. These devices include high efficiency particulate arrestors, cyclones, and scrubbers. In the proposed rule, it is anticipated that the facilities will have to make improvements to their housekeeping procedures to comply with the proposed ambient concentration limit of 0.100 μg/m^3 in 2018.

Compliance with PR 1420.2

To meet the ambient lead concentration, point source limits and compliance plan requirements of PR 1420.2, the some facilities will be required to increase housekeeping requirements.are expected to further control lead emissions. Since PR1420.2 is regulating sources that are already regulated under Rule 1420, it is not expected that additional point source controls will be needed since Rule 1420 established a control efficiency requirement of 99 percent for particulate matter and 98 percent for lead. The following discusses the control equipment currently in place or that could potentially be installed, if needed through a Compliance Plan or it is found that a facility is currently not meeting the control efficiency specified in PR1420.2. to assist in achieving compliance with the proposed lower limits. However, tThe control of fugitive lead dust is anticipated to be the primary method to comply with the new ambient lead concentration limits.

Emissions at the facilities are generally categorized as either point source emissions or fugitive emissions. Point source emissions are those emissions that are vented to a stack where the stack can be from a specific piece of equipment such as a furnace or building. Fugitive emissions are emissions that are not contained and/or not captured in air pollution control device and are released to the ambient air. Fugitive emissions can settle on surfaces such as roof tops and ground surfaces and can be re-entrained in the ambient air.

Fugitive emissions can accumulate in and around process areas, from point sources, raw material storage areas, on roof tops, and during maintenance operations to name a few. There are a variety of housekeeping and containment strategies that can be implemented to minimize fugitive emissions.

If the compliance plan is triggered, it is assumed that facilities will first enhance the housekeeping and maintenance provisions already in place by increasing the frequency of those activities, before opting to installing additional pollution control equipment.

Point Source Control Strategies for Lead

The following describes lead point source control strategies. As with any type of control device, maintenance and proper operation of the control device are important to ensure the control device can achieve its maximum control efficiency. The following provides a description of baghouses and filter controls, and high efficiency particulate arrestors (HEPA). Use of multistage point source controls such as use of baghouse filters and HEPA filters can improve the capture efficiency and provide additional protection. Although wet scrubbers and electrostatic precipitators might also be used, based on a review of the facilities, it is assumed that these facilities would likely use multistage baghouses and filters as their air pollution control equipment due to the lower operational costs. Lead emissions from lead processes discussed in the previous section would be vented to one or more lead control devices listed below:

Point source emissions from the processes discussed in the previous section can be vented to one or more emission control devices listed below. In general for lead particulate controls, a series of filter media and/or scrubbers can be used to control lead emissions. It is imperative that the control of emissions, including the routing of these emissions to the appropriate emission control device, is designed, maintained, and operated properly in order to achieve the intended level of control described herein.

Baghouses and Filters

Baghouses operate by collecting particles on a fabric filter. Typically, they consist of fabric bags of tubular or envelope shapes. As an air stream flows through the bags, small particles are initially captured and retained on the fabric filter by one or a combination of the following collection mechanisms: impaction, direct interception, diffusion, electrostatic attraction, and gravitational settling. Once dust has accumulated on the walls of the bags, the "dust mat" acts as a sleeve to further increase particulate matter capture. PR 1420.2 requires that filter bags be polytetrafluoroethylene or materials that are equally as effective for control of particulate emissions.

Baghouses are commonly used in metal melting operations. They have one of the highest control efficiencies for particulate emissions, and the captured particulate can be recycled to recover metal. Operating parameters of melting operations, such as exhaust stream temperature, gas stream velocity, and particulate chemical properties must be taken into account when designing the baghouse.

Daily maintenance and monitoring of the baghouse is necessary to ensure that it continuously meets the required standard of efficiency. Gas volume, temperature, pressure drop, and dust load are monitored continuously or intermittently. Baghouse shaking and sending pulses of air backwards through the bags is done at specific intervals, or when the bags are overloaded, to remove the captured particulate matter from the bags and drop it into a hopper below the bags.

Baghouse and filter technology combined can achieve overall particulate matter efficiencies. A well designed baghouse can control 99 percent of lead particulate emissions. Gases and vapors are not controlled by baghouses.

Arrays of filters are also used to collect particulate matter. They can be used after the bags in a baghouse to further reduce emissions or can be used alone as in a spray booth. Filters are often used in combination with a prefilter which is replaced on a regular basis allowing the bank of filter cartridges to last longer.

Used in conjunction with a prefilter, high-efficiency particulate air (HEPA) filters can trap particles as small as 0.3 µm at an efficiency of 99.97 percent or greater. Like cartridge filters, HEPA filter elements use a pleated design. HEPA filters are generally limited to ambient temperature (100 degrees Fahrenheit), though special applications for higher temperatures are available. Unlike bags or cartridge filters, HEPA filters are not automatically cleaned. When a HEPA filter element becomes loaded with particulate matter, the element is replaced and disposed of as hazardous waste. Filters can be applied to controls such as baghouses to reduce emissions from lower temperature exhaust streams and fugitive dust emissions collected within total enclosures. They can also be utilized in negative air equipment or vacuums used to conduct housekeeping activities throughout the facility. Proposed Rule 1420.2 requires filter media including HEPA and cartridge-type filters to be rated by the manufacturer to achieve a minimum of 99.97 percent controlled efficiency for 0.3 micron particles.

Ambient Source Control Strategies for Lead

Fugitive Lead-Dust Control

Fugitive dust at lead metal melting facilities can be a major source of lead emissions. Fugitive lead dust can accumulate in and around process areas near lead point sources, on roof tops in and around a facility, and near maintenance operations. There are a variety of housekeeping and containment strategies that can be implemented to minimize fugitive lead dust. Housekeeping activities must be implemented frequently and properly to ensure they are effective. The concept behind many of these strategies is to either contain or remove lead dust so it cannot become airborne. Housekeeping practices specifying adequate frequencies and locations for all cleanings to be performed are also critical in the effectiveness to control fugitive lead-dust emissions. The following summarizes some potential fugitive lead dust control strategies:

- Pave roadways subject to vehicular and foot traffic;
- Clean paved areas through vacuuming, vacuum sweepers, and use of wet suppression;
- Wet wash or vacuum areas where lead particulate can accumulate such as roof tops and areas where lead-containing wastes are stored or disposed of;
- Clean (i.e. sweeping, vacuuming, dusting) areas where lead dust may accumulate due to accidents, process upsets or equipment malfunctions;
- Store and transport all materials capable of generating any amount of fugitive lead-dust in sealed, leak-proof containers, or stabilize using dust suppressants approved by the Executive Officer; and
- Use enclosures or containment areas during maintenance activities and storage of lead-containing materials.

CHAPTER 2

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Discussion and Evaluation of Environmental Checklist

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	Proposed Rule 1420.2
Lead Agency Name:	South Coast Air Quality Management District
Lead Agency Address:	21865 Copley Drive, Diamond Bar, CA 91765
Rule Contact Person:	Eugene Kang, (909) 396-3524
CEQA Contact Person:	Cynthia Carter, (909) 396-2431
Project Sponsor's Name:	South Coast Air Quality Management District
Project Sponsor's Address:	21865 Copley Drive, Diamond Bar, CA 91765
General Plan Designation:	Not applicable
Zoning:	Not applicable

Description of Project:	PR 1420.2 would protect public health by reducing lead emissions produced by lead melting facilities. PR 1420.2 applies to metal melting facilities in the SCAQMD that melt 100 tons or more of lead annually. PR 1420.2 would accomplish this by limiting the ambient lead concentration, imposing housekeeping, limiting the point source emissions, conducting periodic source testing, and requiring ambient air lead monitoring and sampling. Owner/operators of facilities would be required to meet an ambient lead limit of 0.150 micrograms per cubic meter (μg/m^3) averaged over any 30 consecutive days upon date of adoption if the facility currently has approved ambient air monitoring and sampling sites.~~effective September 4, 2015.~~ Facilities that do not currently conduct ambient air monitoring will be required to meet the ambient limit no later than 90 days after approval of an ambient air monitoring plan. The limit would be further reduced to 0.100 μg/m^3 effective January 1, 2018. Improvements to building enclosures and additional control equipment may be necessary to comply with the proposed ambient standard for some facilities. The proposed rule also requires implementation of a Compliance Plan if a facility exceeds ~~an~~the ambient air lead concentration of 0.150 μg/m^3 beginning January 1, 2017 and exceeds the 0.100 μg/m^3 three times within a rolling 24-month period beginning April 1, 2018.~~or a total facility mass lead emission rate of 0.080 lb/hr after January 1, 2018.~~ The environmental analysis in the Revised Draft EA concluded that PR 1420.2 would not generate any significant adverse environmental impacts. PR 1420.2 would affect six facilities that are on lists of California Department of Toxics Substances Control hazardous waste facilities per Government Code §65962.5 (http://www.envirostor.dtsc.ca.gov/public; accessed on July 16, 2015)
Surrounding Land Uses and Setting:	Large industrial/commercial facilities melting metal
Other Public Agencies Whose Approval is Required:	None

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The following environmental impact issues have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "✓" may be adversely affected by the proposed project. An explanation relative to the determination of the significance of the impacts can be found following the checklist for each area.

☑	Aesthetics	☐	Geology and Soils	☐	Population and Housing
☐	Agricultural Resources	☑	Hazards and Hazardous Materials	☐	Public Services
☑	Air Quality	☑	Hydrology and Water Quality	☐	Recreation
☐	Biological Resources	☐	Land Use and Planning	☑	Solid/Hazardous Waste
☐	Cultural Resources	☐	Mineral Resources	☐	Transportation/Traffic
☑	Energy	☑	Noise	☑	Mandatory Findings

DETERMINATION

On the basis of this initial evaluation:

☑ I find the proposed project, in accordance with those findings made pursuant to CEQA Guideline §15252, COULD NOT have a significant effect on the environment, and that an ENVIRONMENTAL ASSESSMENT with no significant impacts has been prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will NOT be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. An ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☐ I find that the proposed project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL ASSESSMENT will be prepared.

☐ I find that the proposed project MAY have a "potentially significant impact" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL ASSESSMENT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL ASSESSMENT pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL ASSESSMENT, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Date: July 17, 2015 **Signature:** Jillian Wong

Jillian Wong, Ph.D.
Program Supervisor, CEQA Section
Planning, Rules, and Area Sources

DISCUSSION AND EVALUATION OF ENVIRONMENTAL IMPACTS

The objective of PR 1420.2 is to reduce the public's exposure to lead that is associated with lead emissions from metal melting facilities. PR 1420.2 would establish requirements for these facilities. One of the key components of PR 1420.2 is reducing lead point source emissions and the ambient air lead concentration (see Chapter 1- Project Description for a thorough discussion on the new proposed rule requirements).

Some of the facilities already comply with the proposed rule's key requirements including ambient air monitors, point source emission controls, total enclosures, and housekeeping requirements. ~~All~~ Most of the facilities will be subject to new source tests. In addition, if a facility exceeds the rule's ambient monitoring limits, implementation of a compliance plan is triggered. The compliance plan will include measures such as increased frequency of housekeeping measures, total enclosures under negative air, additional air pollution control devices (APCDs) such as multi staged baghouses and HEPA filters.

In order to comply with PR 1420.2, which includes ambient air monitoring, point source limits, total enclosure requirements, point source control equipment, and housekeeping and maintenance provisions, the CEQA analysis assumes a worst case scenario where facilities are expected to need to do further actions to meet the core requirements of the proposed rule and that some facilities could be required to implement additional controls as part of a compliance plan.

PR1420.2 anticipates that facilities would need to control their fugitive dust emissions by implementing specific housekeeping and maintenance measures. In analyzing potential environmental impacts, the SCAQMD staff gathered information from the 13 facilities to understand existing practices and controls to i~~n~~dentify additional controls and measures that would be expected to be implemented to meet the requirements of PR1420.2. For the purpose of the CEQA analysis, reasonable worst-case assumptions have been made, based on lead emissions inventories reported to the SCAQMD AER program (i.e., for years 2010 through 2012) and information available from the SCAQMD permitting database (including available source test reports and available monitoring data): The analysis evaluated impacts that could potentially occur from implementing the core requirements of PR1420.2 and measures that could be implemented under a compliance plan. Regarding core requirements the following assumptions have been made: all facilities would implement all housekeeping and maintenance provisions; two facilities are not completely paved and will require paving; 12 facilities would require on-site ambient air monitors (Gerdau already operates on-site monitors), two facilities would need to construct total enclosures, five facilities would increase water usage and five facilities would need to use a different filter media for their existing pollution control devices. Based on a review of the facilities, it is assumed that no more than 10 facilities will trigger the need for a compliance plan. The compliance plan will identify the potential cause of the ambient monitoring violation as well as additional measures to control those emissions. The following assumptions are used for implementation of measures in the compliance plan: four facilities would need to retrofit an existing building to install a negative air pressure system, and all facilities would implement enhanced housekeeping requirements. Based on staff's understanding of the operations at the facilities that likely to need a compliance plan, the facilities will opt to enhance the existing housekeeping measures by increasing the frequency (i.e. increased roof washing or vacuuming of structures involved with the storage, handling, or processing of lead-containing materials and increased vacuuming of on-site areas) before opting to install additional APCDs. PR 1420.2 establishes a lead point source control efficiency requirement greater than 99 percent, which is slightly higher than what is required under Rule 1420 which is 98 percent control efficiency for lead and 99 percent control efficiency for particulate matter. As a result, most facilities are expected to meet point source requirement of PR 1420.2. It is expected that some improvements will be needed for point source controls such as increased maintenance, for those facilities that are required to implement a compliance plan and the point source emission rate was greater than 0.08 lb/hour. Although wet scrubbers, electrostatic precipitators, and wet electrostatic precipitators are viable APCD options, staff assumes that the facilities will likely opt to install HEPA filters or baghouses due to the lower operational costs. The potential environmental impacts associated with PR 1420.2 are summarized in Table 2-1. Although the facilities could potentially utilize other measures, that would be speculative at this time.

Of the facilities which would need to comply with PR 1420.2, one facility is expected to have an approved HRA that exceeds the action risk level in Rule 1402 by the time Rule 1420.2 is adopted. That facility has already secured permits to construct and operate a new baghouse. The environmental impacts associated with the baghouse were previously analyzed in the CEQA document prepared for that permit. This e facility will likely need to prepare a risk reduction plan under Rule 1402. It is anticipated that the measures in the risk reduction plan will be consistent with PR 1420.2 and will include the installation of a negative air pressure system in the total enclosures and increased frequency of housekeeping measures such as sweeping. The analysis in this CEQA document included the environmental impacts associated with the installation of the negative air pressure system and increased housekeeping as part of compliance with PR 1420.2.

Table 2-1 CEQA Summary of PR 1420.2 Requirements

Key Requirements	Facilities	Physical Actions Anticipated	Environmental Topics to be Analyzed:
Ambient Air Monitoring Requirements	One facility has a SCAQMD approved ambient air monitor. Compliance with this provision will potentially create impacts at 12 facilities.	Construction: Install monitors Operation: Vehicle trips (Collect Filters, Analyze samples)	Air Quality, Energy, Transportation
Point Source Emission Controls	All 13 facilities currently have point source emission controls. However, five facilities would likely need to replace the filter media in their existing control devices.	Construction: None Operation: Increased frequency in filter replacement due to increased control efficiency	Air Quality, Solid Waste
Total Enclosures	Two facilities do not have total enclosures and will need to construct them to comply with this provision. Only one facility is expected to have an approved HRA that exceeds the action risk level in Rule 1402 by the time Rule 1420.2 is adopted and will need to construct a total enclosure under negative pressure.	Construction: Installation of total enclosure; Installation of negative air system Operation: Blowers	Air Quality, Energy, Transportation
Housekeeping Requirements	Two facilities are not completely paved and will require paving to comply with this provision. All facilities would need to comply with the housekeeping provisions.	Construction: Paving Operation: Vacuum Truck, Roof Washing, Haul waste and wastewater, Aerial Lifts, Reduced on-site speed limit	Air Quality, Energy, Hazardous Material, Hydrology, Solid Waste, Transportation
Source Testing	All facilities will be required to have annual or biannual source tests to comply with this provision.	Construction: None Operation: Vehicle trips, Analysis of samples	Air Quality, Energy, Transportation

Key Requirements	Facilities	Physical Actions Anticipated	Environmental Topics to be Analyzed:
Compliance Plan	The compliance plan will include measures such as increased frequency of housekeeping measures, total enclosures under negative air, additional APCD such as adding an additional baghouse or HEPA filters in series with the existing APCD.	Construction: APCD (foundation, and installation for larger blower) Operation: Blower and filter replacement; Vehicles needed for additional workers	Air Quality, Energy, Hydrology, Solid waste, Transportation

PR 1420.2 is also requiring additional reporting and recordkeeping. Because these rule requirements are administrative in nature, no environmental impacts would be expected.

ENVIRONMENTAL CHECKLIST AND DISCUSSION

I. AESTHETICS.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☑	☐

Significance Criteria

The proposed project impacts on aesthetics will be considered significant if:

- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

Discussion

I. a), b), c) & d) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. All construction activities would occur on-site at these existing facilities within the facility boundaries. Although most of the ambient air monitors will be located within the property boundaries, it is possible that some monitors might be placed in an off-site location, in close proximity to the facility. The construction of total enclosures would occur on-site and additional lighting might be required on the outside of the enclosure, depending on the operating schedule of the facility. However, any new lighting is expected to be similar in character to the existing lighting on-site.

Off-site monitors may be placed around the facilities. Off-site monitors would be placed manually without heavy construction. The off-site monitors typically consist of a two foot by eight foot platform, two meters above the ground. The monitors are place one meter above the platform.

The monitors are expected to appear similar to the industrial area surrounding the existing facilities.

Since PR 1420.2 affects operations on-site at existing facilities in industrial areas, any new construction at these facilities is expected to be similar to existing buildings or other structures, and off-site air monitors are expected to appear similar to the surrounding industrial area, PR 1420.2 is not expected to obstruct scenic resources or degrade the existing visual character of a site, including but not limited to, trees, rock outcroppings, or historic buildings. Further, additional light or glare is expected to be similar to existing lighting. Therefore, PR 1420.2 is not expected to adversely affect day or nighttime views in the area.

Based upon these considerations, significant adverse aesthetics impacts are not anticipated. Since no significant aesthetics impacts were identified, no mitigation measures are necessary or required.

II. AGRICULTURE AND FOREST RESOURCES.

Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency, to non- agricultural use?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104 (g))?	☐	☐	☐	☑
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑

Significance Criteria

Project-related impacts on agriculture and forest resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code § 51104 (g)).
- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

Discussion

II. a), b), c), & d) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, additional APCDs, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Ambient air monitors may be placed off-site in the surrounding industrial area.

In general, the facilities and surrounding industrial areas are not located on or near areas zoned for agricultural use, Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency. Therefore, the proposed project would not result in any construction of new buildings or other structures that would require converting farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract. Since the proposed project would not substantially change the facility or process at the facilities and would occur within the existing facility boundaries, there are no provisions in PR 1420.2 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements relative to agricultural resources would be altered by the proposed project.

The facilities are located in an industrial area in the urban portion of the Basin that is not near forest land. Therefore, the proposed project is not expected to conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104 (g)) or result in the loss of forest land or conversion of forest land to non-forest use.

Since PR 1420.2 would not affect the placement of affected equipment near farmland, the proposed project is not expected to result in converting farmland to non-agricultural use; or conflict with existing zoning for agricultural use, or a Williamson Act contract. Similarly, it is not expected that PR 1420.2 would conflict with existing zoning for, or cause rezoning of, forest land; or result in the loss of forest land or conversion of forest land to non-forest use. Consequently, the proposed project would not create any significant adverse agriculture or forestry impacts. Since no significant agriculture or forestry resources impacts were identified, no mitigation measures are necessary or required.

III. AIR QUALITY AND GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑	☐
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☐	☑	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☑	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☑	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☑	☐
f) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	☐	☐	☑	☐
g) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
h) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☑	☐

Significance Criteria

To determine whether or not air quality impacts from the proposed project may be significant, impacts will be evaluated and compared to the criteria in Table 2-2~~Table 2-2~~.

Table 2-2 SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction** [b]	***Operation*** [c]
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
Sox	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day

Toxic Air Contaminants (TACs), Odor, and GHG Thresholds	
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
GHG	10,000 MT/yr CO2eq for industrial facilities
Ambient Air Quality Standards for Criteria Pollutants [d]	
NO2 1-hour average annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)
PM10 24-hour average annual average	 10.4 $\mu g/m^3$ (construction)[e] & 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$
PM2.5 24-hour average	 10.4 $\mu g/m^3$ (construction)[e] & 2.5 $\mu g/m^3$ (operation)
SO2 1-hour average 24-hour average	 0.25 ppm (state) & 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)
Sulfate 24-hour average	 25 $\mu g/m^3$ (state)
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)
Lead 30-day Average Rolling 3-month average	 1.5 $\mu g/m^3$ (state) 0.15 $\mu g/m^3$ (federal)

[a] Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
[b] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[c] For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[d] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[e] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day ppm = parts per million $\mu g/m^3$ = microgram per cubic meter ≥ = greater than or equal to
MT/yr CO2eq = metric tons per year of CO2 equivalents > = greater than

Discussion
The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, additional APCDs and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Ambient air monitors will likely be placed within the boundaries of the facility, however, some may be placed off-site, just outside of the facility boundary All construction activities would occur on-site at the existing facilities.

III. a) The SCAQMD is required by law to prepare a comprehensive district-wide Air Quality Management Plan (AQMP) which includes strategies (e.g., control measures) to reduce emission levels to achieve and maintain state and federal ambient air quality standards, and to ensure that new sources of emissions are planned and operated to be consistent with the SCAQMD's air quality goals. The AQMP's air pollution reduction strategies include control measures which target stationary, area, mobile and indirect sources. These control measures are based on feasible methods of attaining ambient air quality standards. Pursuant to the provisions of both the state and federal Clean Air Acts (CAA)s, the SCAQMD is required to attain the state and federal ambient air quality standards for all criteria pollutants, including lead. PR 1420.2 would not obstruct or conflict with the implementation of the AQMP because lead emission reductions are in addition to emission reductions in the AQMP. Additionally, PR 1420.2 does not include any provisions which would conflict with the attainment of ozone and PM standards in the AQMP. The SCAQMD adopted the 2012 Lead State Implementation Plan (SIP) for Los Angeles County on May 4, 2012, which relies upon Rule 1420 and Rule 1420.1 for lead emission reductions. Further, on November 5, 2010, the Governing Board approved the 2010 Clean Communities Plan (CCP). The CCP is an update to the 2000 Air Toxics Control Plan (ATCP)[3] and its 2004 Addendum. The objective of the 2010 CCP is to reduce the exposure to air toxics and air-related nuisances throughout the district, with emphasis on cumulative impacts. The elements of the 2010 CCP are community exposure reduction, community participation, communication and outreach, agency coordination, monitoring and compliance, source-specific programs, and nuisance.

PR 1420.2 would reduce lead emissions and therefore, be consistent with the goals of the AQMP, 2012 Lead SIP for Los Angeles County, and the 2010 CCP. <u>Additionally, the emissions associated with rule compliance for both construction and operation do not exceed the SCAQMD's CEQA significance thresholds (see analysis in III.b and f).</u> Therefore, implementing PR 1420.2 that further reduces lead emissions would not conflict or obstruct implementation of the 2012 Lead SIP for Los Angeles County, the AQMP or the 2010 CCP.

III. b) and f) ***Criteria Pollutants***

Construction Impacts
<u>New Facilities</u>
SCAQMD staff is not aware of any new lead melting facilities planned to be constructed in the future; therefore, construction of new lead melting facilities is considered speculative according to CEQA Guidelines §15145 and will not be evaluated further in this analysis. The focus of the analysis will be on the 13 known facilities.

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3 SCAQMD Air Toxics Control Plan: http://www.aqmd.gov/home/library/clean-air-plans/clean-communities-plan/air-toxics-control-plan

<u>Existing Facilities</u>

The primary source of construction air quality impacts would be from the rule's key requirements and applicable compliance plan. The key requirements that affect air quality are for installing air monitors, paving and constructing total enclosures, additional APCDs and implementing some of the housekeeping requirements.

To meet the proposed final ambient lead concentration limit of 0.100 $\mu g/m^3$, improvements to housekeeping practices are likely necessary and there will likely also be a need for additional control equipment. Table 2-3 below summarizes potential control strategies that facilities could implement to meet the 0.100 $\mu g/m^3$. All other measures discussed in Table 2-3 will likely be implemented to ensure the facilities can consistently meet the lower ambient lead concentration limit of 0.100 $\mu g/m^3$. Some key requirements are affecting either all or a few facilities. See Appendix B for details.

Table 2-3 CEQA Air Quality Impacts of Key Requirements

Key Requirements	Physical Actions Anticipated
Ambient Air Monitoring Requirements	Construction: Install monitors Operation: Vehicle trips (Collect Filters, Analyze samples)
Point Source Emission Controls	Construction: None Operation: Increased frequency in filter replacement due to increased control efficiency
Total Enclosures	Construction: Install total enclosure, Installation of negative air system Operation: Blowers
Housekeeping Requirements	Construction: Paving Operation: Vacuum Truck, Roof Cleaning, Haul waste and wastewater, Reduced on-site speed limit
Source Testing	Construction: None Operation: Vehicle trips (Analysis of samples)
Compliance Plan	Construction: Install APCD Operation: Blower and filter replacement; Vehicle trips ; increased frequency of housekeeping requirements

For the base requirements of PR 1420.2, it is assumed that 12 facilities would need ambient air monitors, five facilities which have existing APCDs would need to use different filter media to meet the efficiency standards in PR 1420.2, two facilities would need to construct total enclosures, one facility would need to install a negative air pressure system in the total enclosure, two facilities would require paving, and all facilities would need to perform source testing and include housekeeping provisions. Based on a review of the available information and understanding of the operations at each facility, it is assumed that ten facilities may trigger a compliance plan. Therefore, all ten of the facilities may need to enhance their current housekeeping measures by increasing the frequency of the measures, such as additional street sweeping, and washing of structures. For four of the ten facilities, the enhanced housekeeping provisions would not be enough to demonstrate compliance and the installation of multistage add-on controls (i.e. HEPA filters) is anticipated. The type of construction-related activities attributable to facilities that would be installing control equipment would consist predominantly of cranes, cutting, welding, drilling, etc. These construction activities would not involve large-scale grading, slab pouring, or paving activities, that would be undertaken at typical land use projects such as housing developments, shopping centers, new industrial facilities, etc. For the purposes of this analysis, construction activities undertaken at facilities are anticipated to entail the use of portable equipment (e.g., pavers, mixers, generators and compressors) and hand held equipment by small construction crews to weld, cut, and grind metal structures.

For the purpose of the CEQA analysis, reasonable worst-case assumptions have been made: all 13 facilities will implement housekeeping and maintenance measures, twelve would need air monitors, two would need to pave their roads, five facilities would need more efficient filters, and two facilities would construct total enclosures. There is one facility that will be required to retrofit their existing building to enclose it fully and install a negative air system in order to comply with PR 1420.2. For the compliance plan, four facilities would install additional new APCDs and install blowers for negative air pressure.

PR 1420.2 includes requirements for air monitors. Air monitors are placed on two meter height platforms that are two feet wide by eight feet long. Other than placing the monitors on the platforms, air monitors do not require construction. Therefore, no construction emissions are associated with the air monitors. Emissions from the delivery of the air monitors would be negligible and less than the peak day emissions associated with construction of the enclosures, ducting and control systems.

Construction emissions were estimated to be completed in different phases (paving of roads, installation of APCD for compliance plan, and total enclosures)[4]. In addition, criteria pollutant emissions were calculated for all on-road vehicles transporting workers, vendors, and material removal and delivery (see Appendix B). It is important to note that the construction emissions associated with complying with the base requirements of PR 1420.2 will not overlap with the construction emissions from the compliance plan, as the compliance plan will only be triggered after the base requirements are met. However, since the compliance plan is triggered after the base requirements are met, there is the potential for overlap between the operational base emissions and the construction of the compliance plan. These impacts have been estimated and are discussed below. As all phases are entirely completed before the next phase can commence, there would be no overlap of construction phases for the construction of the key requirements. Therefore, the emissions are not additive at each facility. One of the facilities will need to pave a portion of the site and make modification to existing enclosures prior to the installation of the negative air pressure system (permits have already been secured for the ventilation portion of the negative air pressure system); one other facility which needs to be paved will not require additional construction; another two facilities will only require construction of total enclosures. Given the short duration of construction and the amount of time for facilities to comply with PR 1420.2, staff assumed that the construction phases at these different facilities would not overlap. There are a number of factors that would preclude concurrent construction activities including: availability of construction crews, type and size of control equipment to be constructed, engineering time necessary to plan and design the control equipment, permitting constraints, etc. Furthermore, as a "worst-case," the SCAQMD's air quality impacts analysis assumes that construction could take

[4] In general, no or limited construction emissions from grading are anticipated because modifications or installation of new equipment would occur at existing industrial/commercial facilities and, therefore, would not be expected to require digging, earthmoving, grading, etc.

up to two months to complete. Depending on the type and size of the control equipment to be constructed, actual construction time could be substantially less than two months. Further, some facilities could reduce emissions through methods other than installing control equipment, thus, eliminating construction impacts at those facilities. Construction emissions at any one facility would not exceed any of the significance thresholds identified in Table 2-4~~Table 2-4~~. Finally, once construction is complete, construction air quality impacts would cease. Table 2-4~~Table 2-4~~ presents the results of the SCAQMD's construction air quality analysis. Appendix B contains the spreadsheets with the results and assumptions used for this analysis.

The peak daily emissions vary for each pollutant depending on the construction phase. Peak daily emissions of all pollutants are the highest for building the total enclosures phase of construction. It was conservatively assumed that peak daily emissions are based on the largest total enclosure. The significance determination for the construction is based on the peak daily emissions during any construction phase, and as previously discussed construction phases do not overlap. Therefore, all of the construction impacts from the project are not significant for criteria pollutant emissions.

Table 2-4 PR 1420.2 Daily Peak Construction Emissions in SCAQMD for Key Requirements

Key Requirements: Construction Phase	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOx, lb/day
Ambient Air Monitoring Installation	N/A	N/A	N/A	N/A	N/A	N/A
Point Source Emission Controls	N/A	N/A	N/A	N/A	N/A	N/A
Housekeeping: Paving of roads	19	29	1.8	1.6	1.1	0.0
Total Enclosure & Negative Air System	**34**	**80**	**4.2**	**3.8**	**9.0**	**0.08**
Source Testing	N/A	N/A	N/A	N/A	N/A	N/A
Significance Threshold - Construction, lb/day	550	100	150	55	75	150
Exceed Significance?	No	No	No	No	No	No

Compliance Plan Requirement

Based on a review of the facilities that would be subject to the proposed rule, it is assumed that no more than ten facilities will trigger the need for a compliance plan. The compliance plan is required when the ambient monitors exceed the proposed rule's concentration limit. The compliance plan will identify the potential cause of the ambient monitoring violation as well as additional measures to control those emissions. Based on staff's understanding of the operations at the facilities likely to need a compliance plan, the facilities will opt to enhance the existing housekeeping measures by increasing their frequency (i.e. increased roof cleaning or vacuuming of structures involved with the storage , handling, or processing of lead-containing materials and increased vacuuming of on-site areas) before opting to install additional APCDs. The compliance plan requirement will be implemented after the construction of the proposed rule's key requirements are completed. Therefore, there could be an overlap between construction emissions for the compliance plan and operational impacts, as shown in Table 2-5. When the impacts from compliance plan construction are added to the operational impacts and compared to SCAQMD's operational thresholds, the impacts continue to be less than significant.

Table 2-5 PR 1420.2 Daily Peak Construction Emissions in SCAQMD for Compliance Plan

Compliance Plan: Construction Phase	CO	NOx	PM10	PM2.5	VOC	SOx
	lb/day					
Foundation for blower for APCD or Blowers-Negative air pressure	**19**	**29**	**1.8**	**1.6**	1.1	**0.0**
Installation of Blowers- Negative air pressure	10	24	1.0	0.9	2.2	0.0
Installation of APCD	12	28	1.2	1.0	**2.6**	0.0
Operational Emissions (From Table 2-6)	**8.29**	**19.35**	**0.63**	**0.54**	**1.52**	**0.04**
Total Worse-Case Impacts (Construction + Operation)	**27.29**	**48.35**	**2.43**	**2.14**	**4.12**	**0.04**
Significance Threshold - Operation, lb/day	550	55	150	55	55	150
Exceed Significance?	No	No	No	No	No	No

Operational Impacts

Total operational emissions from mobile sources (waste disposal trucks, vacuum trucks, source testing trucks, and air sampling trips) are shown in Table 2-6. The facilities currently send operational hazardous waste to the Nevada Landfill or their local melter for proper disposal. The proposed project may require one additional haul truck trip per facility to the Nevada Landfill per year. Criteria emissions are based on a 200 mile round trip from the I-15 district border to the facilities.

PR 1420.2 would require source test events for the applicable facilities (potential of 13 source testing events per year). Source testing would require additional gasoline-fueled vehicle round trips to the facility on the day of source testing. It is unlikely that all the facilities would test on the same day; therefore only one additional gasoline-fueled vehicle round trip is expected on any given day. Air monitors would be visited every one in six days. A conservative assumption is to have two facilities per day have their monitors checked. Assuming a total of 80 miles may be traveled round trip to visit the air monitors. Also for this analysis, it is assumed that 4 facilities may trigger a compliance plan. Therefore, these 5 facilities may need additional street sweeping and the air quality impacts are analyzed in Table 2-6 and Appendix B.

As indicated in Table 2-6, operational emissions anticipated from implementing PR 1420.2 do not exceed any significance threshold and therefore, are considered insignificant. ~~facilities~~

Table 2-6 PR 1420.2 Daily Peak Operational Emissions

Key Requirements: Operation Phase[5]	**CO, lb/day**	**NOx, lb/day**	**PM10, lb/day**	**PM2.5, lb/day**	**VOC, lb/day**	**SOx, lb/day**
Ambient Air Monitoring: Mobile Sources	1.32	0.15	0.014	0.01	0.15	0
Point Source Emission Controls: Mobile Sources	1.6	7.2	0.216	0.154	0.31	0.01
Housekeeping: Mobile Sources[a]	4.56	11.26	0.3685	0.3531	0.95	0.0325
Total Enclosures	N/A	N/A	N/A	N/A	N/A	N/A
Source Testing: Mobile Sources	0.16	0.01	0.0042	0.0018	0.02	0.0003
Compliance Plan: Mobile Sources	0.65	0.73	0.027	0.0227	0.09	0
Total Operational Emissions	**8.29**	**19.35**	**0.6297**	**0.5416**	**1.52**	**0.0428**
Significance Threshold - Operation, lb/day	550	55	150	55	55	150
Exceeds Significance?	No	No	No	No	No	No

[a] Housekeeping is the sum of haul trucks, vehicle sweeping, and aerial lifts. See Appendix B

The direct and indirect criteria emissions are totaled, in Table 2-6~~Table 2-6~~ and are less than the SCAQMD's mass daily operational significance thresholds; therefore, the proposed amendments are not expected to result in significant adverse operational criteria pollutant emission impacts.

Indirect Criteria Pollutant Emissions from Electricity Consumption

Indirect criteria pollutant and GHG emissions are expected from the generation of electricity to operate new equipment that occurs off-site at electricity generating facilities (EGFs). Emissions from electricity generating facilities are already evaluated in the CEQA documents for those projects when they are built or modified. The analysis in Section VI. Energy b), c) and d)) demonstrates that there is sufficient capacity from power providers for the increased electricity consumption for PR 1420.2.

Under the SCAQMD Regional Clean Air Incentives Market (RECLAIM) program (that regulates NOx and SOx emissions), EGFs were provided annual allocations of NOx and SOx emissions that typically decline annually. However, the proposed project does require an increase in energy use and that increase in emissions from generating the additional energy (See Section VI Energy for impacts) from the EGFs would be required to offset any potential NOx and SOx emission increases under the RECLAIM program and other pollutants under the New Source Review Project. Thus, air quality impacts from energy generation are anticipated to be to less than significant impacts.

[5] The occasional delivery and disposal of lead or filters, aerial lifts ambient monitoring, and source testing trips are expected to generate mobile source emissions. See Appendix B for details.

III. c) ***Cumulatively Considerable Impacts***

Based on the foregoing analysis, criteria pollutant project-specific air quality impacts from implementing PR 1420.2 would not exceed air quality significance thresholds (Table 2-2 SCAQMD Air Quality Significance ThresholdsTable 2-2 SCAQMD Air Quality Significance Thresholds), cumulative impacts are not expected to be significant for air quality. SCAQMD cumulative significance thresholds are the same as project-specific significance thresholds. Therefore, potential adverse impacts from implementing the proposed rule would not be "cumulatively considerable" as defined by CEQA Guidelines §15064(h)(1) for air quality impacts. Per CEQA Guidelines §15064(h)(4), the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulative considerable.

The SCAQMD guidance on addressing cumulative impacts for air quality is as follows: "As Lead Agency, the SCAQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR." "Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."[6]

This approach was upheld by the Court in *Citizens for Responsible Equitable Environmental Development v. City of Chula Vista* (2011) 197 Cal. App. 4th 327, 334. The Court determined that where it can be found that a project did not exceed the South Coast Air Quality Management District's established air quality significance thresholds, the City of Chula Vista properly concluded that the project would not cause a significant environmental effect, nor result in a cumulatively considerable increase in these pollutants. The court found this determination to be consistent with CEQA Guidelines §15064.7, stating, "The lead agency may rely on a threshold of significance standard to determine whether a project will cause a significant environmental effect." The court found that, "Although the project will contribute additional air pollutants to an existing nonattainment area, these increases are below the significance criteria…" "Thus, we conclude that no fair argument exists that the Project will cause a significant unavoidable cumulative contribution to an air quality impact." As in *Chula Vista*, here the District has demonstrated, when using accurate and appropriate data and assumptions, that the project will not exceed the established South Coast Air Quality Management District significance thresholds. See also, *Rialto Citizens for Responsible Growth v. City of Rialto* (2012) 208 Cal. App. 4th 899. Here again the court upheld the South Coast Air Quality Management District's approach to utilizing the established air quality significance thresholds to determine whether the impacts of a project would be cumulatively considerable. Thus, it may be concluded that the Project will not cause a significant unavoidable cumulative contribution to an air quality impact.

[6] SCAQMD Cumulative Impacts Working Group White Paper on Potential Control Strategies to Address Cumulative Impacts From Air Pollution, August 2003, Appendix D, Cumulative Impact Analysis Requirements Pursuant to CEQA, at D-3, http://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/cumulative-impacts-working-group/cumulative-impacts-white-paper-appendix.pdf?sfvrsn=4.

III. d) ***Toxic Air Contaminants (TAC)***

Construction

Diesel Particulate Matter (DPM) is considered a carcinogenic and chronic TAC. Since construction is expected include less than 60 days with onsite DPM emissions, a HRA was not conducted, consistent with OEHHA Guidance (2015). If subsequent site-specific projects have additional details about TAC impacts, they will be evaluated under CEQA at that time. In addition, adoption of this rule will reduce toxic impacts once implemented by controlling lead emissions. Lead potentially affects both cancer and non-cancer health risks.

Therefore, PR 1420.2 is not expected to generate significant adverse TAC impacts from construction.

Operation

<u>Direct Health Risk Reductions from PR 1420.2</u>

PR 1420.2 is expected to reduce overall TAC emissions. Therefore, PR 1420.2 is expected to have the benefit of reducing adverse health risk impacts from the facilities to nearby sensitive receptors.

<u>Secondary Health Risk Impacts from PR 1420.2</u>

The operation of non-combustion APCDs, that may be needed to comply with PR 1420.2, are not expected to generate any TAC emissions. These APCDs are expected to be powered by electricity, so no new combustion emissions would be generated.

Based on the above discussion, PR 1420.2 is not expected be significant for exposing sensitive receptors to substantial concentrations.

III. e) ***Odor Impacts***

It is assumed that construction is expected to occur on-site at 4 facilities. Also, the affected facility is an industrial facility where heavy-duty diesel equipment (sweepers) and trucks already operate. Therefore, the addition of several pieces of construction equipment and haul trucks are not expected to generate diesel exhaust odor greater than what is already present.

Operation of the new APCDs and blowers are not expected to generate any new odors. There would be no APCDs that include a new combustion system and would be designed to reduce TAC emissions from lead melting facilities, which may potentially further reduce odors.

The facilities are industrial facilities where heavy-duty diesel equipment (haul/delivery) trucks already operate.

Therefore, PR 1420.2 is not expected to generate significant adverse odor impacts.

III. g) and h) ***Greenhouse Gas Impacts***

Total GHG Emissions

PR 1420.2 may result in the generation of 855 amortized metric tons of CO2e construction emissions per year and 74 metric tons of CO2e operational emissions per year. The addition of 929 metric tons of CO2e emissions is less than the SCAQMD significance threshold of 10,000 metric tons per year for CO2e from industrial projects.

Therefore, PR 1420.2 is not expected to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG gases.

Conclusion

Based upon these considerations, the proposed project would not generate significant adverse construction or operational air quality impacts and, therefore, no further analysis is required or necessary and no mitigation measures are necessary or required.

IV. BIOLOGICAL RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c) Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑

e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f)	Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

Significance Criteria

Impacts on biological resources will be considered significant if any of the following criteria apply:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion

IV. a), b), c), d), e) & f) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Ambient air monitors may be placed off-site in the surrounding industrial area. All construction activities would occur on-site at the existing facilities.

In general, the facilities and the surrounding industrial areas currently do not support riparian habitat, federally protected wetlands, or migratory corridors because they are long developed and established foundations used for industrial purposes. Additionally, special status plants, animals, or natural communities identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service are not expected to be found in close proximity to the affected facility. Therefore, the proposed project would have no direct or indirect impacts that could adversely affect plant or animal species or the habitats on which they rely in the SCAQMD's jurisdiction.

Compliance with PR 1420.2 is expected to reduce lead emissions from operations at the facilities, which would improve, not worsen, present conditions of plant and animal life, since these lead emissions would be captured destroyed or disposed of properly before they impact plant and animal life. PR 1420.2 does not require acquisition of additional land or further conversions of riparian habitats or sensitive natural communities where endangered or sensitive species may be found.

PR 1420.2 compliance is not envisioned to conflict with local policies or ordinances protecting biological resources or local, regional, or state conservation plans because it is only expected to affect existing lead melting facilities located in an urbanized, industrial area. PR 1420.2 is designed to reduce lead emissions which would also reduce emissions both inside and outside the boundaries of the facilities and, therefore, more closely in line with protecting biological resources.

Land use and other planning considerations are determined by local governments and no land use or planning requirements would be altered by the proposed project. Additionally, the proposed project would not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan, and would not create divisions in any existing communities because all activities associated with complying with PR 1420.2 would occur at existing established industrial facilities.

The SCAQMD, as the Lead Agency for the proposed project, has found that, when considering the record as a whole, there is no evidence that the proposed project will have potential for any new adverse effects on wildlife resources or the habitat upon which wildlife depends because all activities needed to comply with PR 1420.2 would take place at long developed and established facilities. Accordingly, based upon the preceding information, the SCAQMD has, on the basis of substantial evidence, rebutted the presumption of adverse effect contained in §753.5 (d), Title 14 of the California Code of Regulations. Further, in accordance with this conclusion, the SCAQMD believes that this proposed project qualifies for the no effect determination pursuant to Fish and Game Code §711.4 (c).

Based upon these considerations, significant adverse biological resources impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

V. CULTURAL RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☐	☑
c) Directly or indirectly destroy a unique paleontological resource, site, or feature?	☐	☐	☐	☑
d) Disturb any human remains, including those interred outside formal cemeteries?	☐	☐	☐	☑
e) Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code §21074?	☐	☐	☐	☑

Significance Criteria

Impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance, or tribal cultural significance to a community or ethnic or social group or a California Native American tribe.
- Unique paleontological resources or objects with cultural value to a California Native American tribe are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

Discussion

V. a) There are existing laws in place that are designed to protect and mitigate potential impacts to historical resources. Buildings, structures, and other potential culturally significant resources that are less than 50 years old are generally excluded from listing in the National Register of Historic Places, unless they are shown to be exceptionally important. Even if there are any buildings or structures that may be affected by the proposed project and are older than 50 years, they are generally not considered historically significant since they would not have any of the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Ambient air monitors may be placed off-site in the surrounding industrial area. All construction activities would occur on-site at the existing facilities. None of the facilities include any existing structures that would be considered historically significant, that have contributed to California history, or that pose high artistic values. Therefore, PR1420.2 is not expected to cause any impacts to significant historic cultural resources.

V. b), c), & d) PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Ambient air monitors may be placed off-site in the surrounding industrial area. Since construction-related activities are expected to be confined within the existing footprint of the facilities that have been fully developed and paved, PR 1420.2 is not expected to require physical changes to the environment, which may disturb paleontological or archaeological resources. Furthermore, it is envisioned that these areas are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed. Therefore, the proposed project has no potential to cause a substantial adverse change to a historical or archaeological resource, directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or disturb any human remains, including those interred outside a formal cemeteries. PR 1420.2 is, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the District.

V. e) PR 1420.2 is not expected to require physical changes to a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. Furthermore, the proposed project is not expected to result in a physical change to a resource determined to be eligible for inclusion or listed in the California Register of Historical Resources or included in a local register of historical resources. For these reasons, the proposed project is not expected to cause any substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code §21074.

It is important to note that as part of releasing this CEQA document for public review and comment, the SCAQMD also provided a formal notice of the proposed project to all California Native American Tribes (Tribes) that requested to be on the Native American Heritage Commission's (NAHC) notification list per Public Resources Code §21080.3.1 (b)(1). The NAHC notification list provides a 30-day period during which a Tribe may respond to the formal notice, in writing, requesting consultation on the proposed project.

In the event that a Tribe submits a written request for consultation during this 30-day period, the SCAQMD will initiate a consultation with the Tribe within 30 days of receiving the request in accordance with Public Resources Code §21080.3.1 (b). Consultation ends when either: 1) both parties agree to measures to avoid or mitigate a significant effect on a Tribal Cultural Resource and agreed upon mitigation measures shall be recommended for inclusion in the environmental document [see Public Resources Code §21082.3 (a)]; or, 2) either party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached [see Public Resources Code §21080.3.2 (b)(1)-(2) and §21080.3.1 (b)(1)].

Based upon these considerations, significant cultural resources impacts are not expected from implementing the proposed project. Since no significant cultural resources impacts were identified for any of the issues, no mitigation measures are necessary or required.

VI. ENERGY.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Conflict with adopted energy conservation plans?	☐	☐	☐	☑
b) Result in the need for new or substantially altered power or natural gas utility systems?	☐	☐	☑	☐
c) Create any significant effects on local or regional energy supplies and on requirements for additional energy?	☐	☐	☑	☐
d) Create any significant effects on peak and base period demands for electricity and other forms of energy?	☐	☐	☑	☐
e) Comply with existing energy standards?	☐	☐	☐	☑

Significance Criteria

Impacts to energy and mineral resources will be considered significant if any of the following criteria are met:

- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.

- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

Discussion

VI. a) & e) PR 1420.2 does not require any action which would result in any conflict with an adopted energy conservation plan or violation of any energy conservation standard. PR 1420.2 is not expected to conflict with any adopted energy conservation plans because existing facilities would be expected to continue implementing any existing energy conservation plans.

PR 1420.2 is not expected to cause new development and will only affect existing facilities. At this time, staff has no knowledge of new facilities. As a result, PR 1420.2 would not conflict with energy conservation plans, use non-renewable resources in a wasteful manner, or result in the need for new or substantially altered power or natural gas systems.

VI. b), c) & d. PR 1420.2 will increase the use of electricity from the installation of APCDs, negative air systems and total enclosures. Diesel fuel would be consumed by construction equipment. Gasoline fuel would be consumed by the construction workers vehicles and operational vehicles. The following sections evaluate the various forms of energy sources affected by the proposed project.

Construction-Related Impacts

During the construction phases, diesel and gasoline fuel will be consumed in portable construction equipment (e.g., pavers, mixers, generators and compressors) used to weld, cut, and grind metal structures and by construction workers' vehicles traveling to and from construction sites. To estimate "worst-case" energy impacts associated with the construction phases of the proposed project, the SCAQMD assumed that portable equipment used to weld, cut, and grind metal structures would be operated up to 220 hours in a year (4 hours per day for 55 days). The reader is referred to Appendix B for the assumptions used by the SCAQMD to estimate fuel usage associated with the implementation of the proposed rule.

To estimate construction workers' fuel usage per commute round trip, the SCAQMD assumed that workers' vehicles would get 20 miles to the gallon and would travel 40 miles round trip to and from the construction site in one day. Table 2-7 lists the projected energy impacts associated with the construction and installation at the two facilities at any given time.

Table 2-7 Total Projected Fuel Usage for Construction Activities

Fuel Type	Year 2012 Projected Basin Fuel Demand[a] (mmgal/yr)	Fuel Usage[b] (mmgal/yr)	Total % Above Baseline	Exceed Significance?
Diesel	524	0.0127	2.24 x 10^-3	No
Gasoline	5,589	0.0042	7.47 x10^-7	No

[a] Figures taken from Table 3.3-3 of the 2012 AQMP Final EIR

[b] Estimated peak fuel usage from the implementation of the proposed amendments. Diesel usage estimates are based on portable construction equipment operation. Gasoline usage estimates are derived from construction workers' vehicle daily trips to and from work.

The 2012 AQMP states that 524 million gallons of diesel and 5,589 million gallons gasoline are consumed per year in Los Angeles County. An additional 12,707 gallons of diesel consumed and 4176 gallons of gasoline consumed for the year of construction is not expected to have a significant adverse impact on fuel supplies.

Operational Energy Impacts

Electricity Use

Air monitors are expected to be powered by electricity service near where the air monitors are placed. The air monitors typically require 16 amps of service (six amps for the monitor and 10 amps for vacuum pumps), which would be approximately 0.00152 GW-h (3 monitors/facility x 12 facilities x 16 amps x 110 voltage x 24 hr)[7]. SCAQMD staff estimates there will be additional electricity usage for the new APC equipment and negative air pressure.

It was assumed that 4 additional blowers would be needed for the APCDs required under Compliance Plans and 12 additional blowers to create negative air pressure at the facilities. Electrical energy impacts associated with air monitors and ancillary equipment (e.g., fans, motors, etc.) used in conjunction with the HEPA filters and are not considered significant as shown in Table 2-8.

Table 2-8 PR 1420.2 Additional Electricity Consumption

Energy Use	Consumption (GW-h)
Air Monitors-36	0.00152
Blowers for APCD (100 bhp@ 0.001788 GW-h) x 4	0.7152
Blowers for negative air pressure (100 bhp@ 0.001788 GW-h) x12	2.1456
Total Use:	2.86
SCAQMD District Electrical Demand[1]	113,109
Total Impact % of Capacity	**0.0025**
Significant?	**No**

[1]AQMP 2012 TABLE 3.3-1 2011 Electricity Use GWh (Aggregated, includes self generation and renewables)

Diesel Use

One additional truck trip per day to dispose of additional hazardous material would use 20 gallons (200 miles ÷ 10 mpg). By assuming one truck trip per week, there will be 52 trucks/yr for all of the facilities. The year's total diesel use would be 1,040 gal/yr.

Sweeper Diesel Use

Of the thirteen facilities subject to PR 1420.2, two facilities currently sweep three times a day with mobile sweepers. Diesel use was estimated for the eleven extra sweeping events that would be required at the eleven remaining facilities, plus additional sweeping for the compliance plans. Diesel use was estimated assuming that sweepers would be nine feet wide, sweep over the entire outside area around the production site (i.e., not around administrative buildings) one time a day with two feet of overlap on the return path as the sweepers travel back and forth. Assuming a ten

[7] Power = (A x V)/1000= (16 amps x 110 voltage)/1000= 1.76 kW x 24 hr = 42.24 kW-hr per monitor.

mile per gallon of diesel fuel efficiency x 185 miles from sweeping, approximately 18.5 gallons of diesel would be consumed on a peak day and 4,810 gal/yr.

Aerial Lift Diesel Use

The proposed rule requires roof washings or vacuuming on either a quarterly or semi-annual basis. The facilities would need to use aerial lifts to reach the roofs. PR 1420.2 would require roof cleaning events for the applicable facilities (potential of 13 roof cleaning events per year). It is unlikely that all the facilities would roof clean on the same day. Therefore, only one additional aerial lift diesel-fueled use is expected on any given day. For this analysis, the aerial lifts would be used six hours per day. Diesel fuel use was estimated using a 1.4 gallon per hour fuel consumption from ARB's OFFROAD2007 database. The diesel fuel use from aerial lifts would be 8.4 gallons per day. On a yearly basis, worse-case would be quarterly cleanings for all 13 facilities would consume 439 gal/yr (8.4 gal/day*4 day/yr*13 facilities).

Roof cleaning may be contracted out, so it is assumed that aerial lifts are delivered. A single heavy-duty diesel truck round trip of 40 miles per day is expected to be required on a peak day. Assuming a ten mile per gallon of diesel fuel efficiency approximately 8 gallons of diesel would be consumed on a peak day. On a yearly basis, worse-case would be quarterly deliveries for all 13 facilities would consume 416 gal/yr (8 gal/day*4 day/yr*13 facilities).

Gasoline Use

Source Testing

Additional source testing would require additional gasoline-fueled vehicle trips to the facilities on the day of sources testing. Based on a 20 mile round trip, and a 10 mile per gallon fuel efficiency, approximately 2 gallons of gasoline would be used on the source test day; annually for all 13 facilities would use 26 gal/yr.

Air Monitoring

Two trips per day to visit air monitors, based on average of 80 miles round trip and a 16 mile per gallon fuel efficiency, would consume approximately 5 gallons of gasoline on a peak day; annually for all 13 facilities would use 1,300 gal/yr (5 gal/day x 5 days/week x 52 weeks).

Table 2-9 Annual Total Projected Fuel Usage for Operational Activities

Type of Equipment	Diesel (gal/yr)	Gasoline (gal/yr)
Haul Trucks	1,040	N/A
Sweeper Vehicles	4,810	N/A
Aerial Lifts	855	N/A
Source Testing Vehicle	N/A	13
Air Monitoring Vehicle	N/A	1,300
Total:	6,705	1,313
Year 2012 Projected Basin Fuel Demand (gal/yr) [a]	524,000,000	5,589,000,000
Total % Above Baseline	0.0012	2.34 x 10-5

Exceed Significance?	No	No

[a] Figures taken from Table 3.3-3 of the 2012 AQMP Final EIR

The 2012 AQMP states that 524 million gallons of diesel and 5,589 million gallons gasoline are consumed per year in Los Angeles County. An additional 6,705 gallons of diesel consumed and 1,313 gallons of gasoline consumed per year of operation is not expected to have a significant adverse impact on fuel supplies.

Natural Gas Impacts

No new natural gas impacts are expected.

Therefore, based on the foregoing analysis, the SCAQMD has determined that operational-related activities associated with the implementation of the proposed amendments is necessary and will not use energy in a wasteful manner; will not result in substantial depletion of existing energy resource supplies; nor will significant amounts of fuel be needed when compared to existing supplies. Thus, there are no significant adverse energy/mineral resources impacts associated with the implementation of PR 1420.2.

Based upon these considerations, significant adverse energy impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

VII. GEOLOGY AND SOILS.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☑
• Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☐	☑
• Strong seismic ground shaking?	☐	☐	☐	☑
• Seismic–related ground failure, including liquefaction?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and	☐	☐	☐	☑

	potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☑
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑

Significance Criteria

Impacts on the geological environment will be considered significant if any of the following criteria apply:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion

VII. a) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Ambient air monitors may be placed off-site in the surrounding industrial area. All construction activities would occur on-site at the existing facilities.

Since the proposed project would result in construction activities at existing facilities located in developed industrial settings, minor site preparation is anticipated that could adversely affect geophysical conditions in the jurisdiction of the SCAQMD. PR 1420.2 does not cause the new facility construction. Southern California is an area of known seismic activity and the construction of total enclosures and installation of APCDs at existing facilities to comply with PR 1420.2 is expected to conform to the Uniform Building Code and all other applicable state and local building codes. As part of the issuance of building permits, local jurisdictions are responsible for assuring that the Uniform Building Code is adhered to and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation condition at the site. The Uniform Building Code requirements also consider liquefaction potential and establish stringent requirements for building foundations in areas potentially subject to liquefaction. Thus, the proposed project would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death involving the rupture of an earthquake fault, seismic ground shaking, ground failure or landslides is not anticipated.

VII. b) Currently, 11 facilities are completely paved. As part of the housekeeping requirements in PR 1420.2, the facilities will be required to pave, concrete, asphalt, or otherwise stabilize with dust suppressants all facility grounds. Therefore, PR 1420.2 will reduce the potential for the loss of topsoil and soil erosion at the two facilities which will be paved.

VII. c) Since the proposed project will affect existing facilities, it is expected that the soil types present at the facilities will not be made further susceptible to expansion or liquefaction. Furthermore, subsidence is not anticipated to be a problem since only minor grading, or filling activities are expected occur at facilities. Additionally, the affected areas are not envisioned to be prone to new landslide impacts or have unique geologic features since the affected equipment units are located at existing facilities in industrial areas.

VII. d) & e) Since PR 1420.2 would affect existing facilities located in industrial zones, it is expected that people or property will not be exposed to new impacts related to expansive soils or soils incapable of supporting water disposal. Further, some facilities have some degree of existing wastewater treatment systems that will continue to be used and are expected to be unaffected by the proposed project. Sewer systems are available to handle wastewater produced and treated by each affected facility. Each existing facility affected by the proposed project does not require installation of septic tanks or alternative wastewater disposal systems. As a result, the proposed project will not require facility operators to utilize septic systems or alternative wastewater disposal systems. Thus, implementation of the proposed project will not adversely affect soils associated with a septic system or alternative wastewater disposal system.

Based upon these considerations, significant geology and soils impacts are not expected from the implementation of the proposed project. Since no significant geology and soils impacts were identified for any of the issues, no mitigation measures are necessary or required.

VIII. HAZARDS AND HAZARDOUS MATERIALS.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, and disposal of hazardous materials?	☐	☐	☑	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset conditions involving	☐	☐	☑	☐

	the release of hazardous materials into the environment?				
c)	Emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☑	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public use airport or a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑	☐
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑	☐
g)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☑
h)	Significantly increased fire hazard in areas with flammable materials?	☐	☐	☑	☐

Significance Criteria

Impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Discussion

VIII. a) & b) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. PR 1420.2 is expected to reduce the amount of fugitive lead that is currently being emitted into the atmosphere.

PR 1420.2 may increase the amount of captured lead and subsequently an increase in the amount of lead to be disposed. The additional captured lead emissions through additional housekeeping, air pollution control, building improvement would reduce the lead that is currently emitted into the air. Thus, the capture of these lead emissions would reduce lead exposure to the public and the environment.

Spent lead is already properly transported for treatment offsite and/or out of the Basin. The additional lead captured by new air pollution control systems would be hauled off to a hazardous landfill, which is what the facilities are currently doing. Hence, no new significant hazards are expected to the public or environment through its routine transport, use and disposal.

Therefore, PR 1420.2 is not expected to create a significant hazard to the public or environment through reasonably foreseeable upset conditions involving the release of hazardous materials into the environment.

VIII. c) One facility is located within a quarter mile of a school. However, it is expected that the one facility near the school are taking the appropriate and required actions to ensure proper handling of hazardous or acutely hazardous materials, substances or wastes within one-quarter mile of the existing school.

VIII. d) Government Code §65962.5 refers to hazardous waste handling practices at facilities subject to the Resources Conservation and Recovery Act (RCRA). PR 1420.2 would affect six facilities that are on lists of California Department of Toxics Substances Control hazardous waste facilities per Government Code §65962.5. However, compliance with PR 1420.2 is expected to enhance current hazardous waste handling practices by requiring enclosures or use of closed containers to store or transport lead containing material. Hazardous wastes from the existing facilities are required to be managed in accordance with applicable federal, state, and local rules and regulations. Therefore, compliance with PR 1420.2 would not create a significant hazard to the public or environment.

VIII. e) PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Two of the facilities are located within two miles of a public airport. Senior Aerospace is located approximately 0.6 miles east of the Burbank Airport but is not located within the airport influence area. Teledyne Battery Products is located approximately 1.7 miles southeast of the San Bernardino International Airport but is not within the airport safety review area. ~~However, the installation of enclosures or the addition of new APCDs would be consistent with any applicable airport land use plan.~~ Therefore, PR 1420.2 is not expected to result in a safety hazard for people residing or working in the project area even within the vicinity of an airport.

VIII. f) Emergency response plans are typically prepared in coordination with the local city or county emergency plans to ensure the safety of the public (surrounding local communities), and the facility employees as well. The proposed project would not impair implementation of, or physically interfere with any adopted emergency response plan or emergency evacuation plan. It is expected that the existing facilities already have an emergency response plan in place, where required. The addition of air pollution control equipment or total enclosures may require a modification of the existing emergency response plan at the facilities. However, no environmental impacts are expected from the emergency plan's modifications. Thus, PR 1420.2 is not expected to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

VIII. g) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas; therefore, there is no risk from wildland fires.

VIII. h) The Uniform Fire Code and Uniform Building Code set standards intended to minimize risks from flammable or otherwise hazardous materials. Local jurisdictions are required to adopt the uniform codes or comparable regulations. Local fire agencies require permits for the use or storage of hazardous materials and permit modifications for proposed increases in their use. Permit conditions depend on the type and quantity of the hazardous materials at the facility. Permit conditions may include, but are not limited to, specifications for sprinkler systems, electrical systems, ventilation, and containment. The fire departments make annual business inspections to ensure compliance with permit conditions and other appropriate regulations. Further, businesses are required to report increases in the storage or use of flammable and otherwise hazardous materials to local fire departments. Local fire departments ensure that adequate permit conditions are in place to protect against potential risk of upset. The proposed project would not change the existing requirements and permit conditions.

The proposed project would also not increase the existing risk of fire hazards in areas with flammable brush, grass, or trees. No substantial or native vegetation typically exists on or near the facilities (specifically because such areas could allow the accumulation of fugitive lead dust), the existing rule requires the encapsulating (paving or asphalting) of all facility grounds. So the proposed project is not expected to expose people or structures to wild fires. Therefore, no significant increase in fire hazards is expected at the facilities associated with the proposed project.

Based upon these considerations, significant adverse hazards and hazardous materials impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

IX. HYDROLOGY AND WATER QUALITY.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Violate any water quality standards, waste discharge requirements, exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, or otherwise substantially degrade water quality?	☐	☐	☑	☐

b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☑	☐
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on- or off-site or flooding on- or off-site?	☐	☐	☑	☐
d)	Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☑	☐
e)	Place housing or other structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, which would impede or redirect flood flows?	☐	☐	☐	☑
f)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑
g)	Require or result in the construction of new water or wastewater treatment facilities or new storm water drainage facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
h)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑	☐

i)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☑	☐

Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.
- The project increases demand for total water by more than five million gallons per day.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Discussion

As identified in Table 2-1, some facilities with wastewater treatment systems have the potential to increase water demand in the district to comply with the housekeeping requirements. The facilities must treat process water and storm water before it is discharged to the publicly owned treatment works (POTWs). The discharged water must comply with existing lead water quality standards. The following sections discuss the water impacts in detail.

Using the assumption from facilities that already comply with similar housekeeping requirements, the facilities may use an additional 82,372 gallons/day and an additional 82,372 for those facilities that require a compliance plan (see Appendix B for details).

IX. a) PR 1420.2 would not alter any existing wastewater treatment requirements of the POTW and Regional Water Quality Control Board or otherwise substantially degrade water quality that the requirements are meant to protect. It is assumed that the facilities that choose to use water have wastewater discharge permits and must comply with the affluent limits. Discharge concentrations are currently and would continue to be limited by the Industrial Wastewater Discharge Permit.[8]

IX. b) PR 1420.2 would not require the use of groundwater. The facilities use potable water that is supplied by their local utility company and then directed to the sanitary sewer. Therefore, it would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

IX. c) & d) While most of the facilities affected by PR 1420.2 are completely paved, two of the facilities will require paving of approximately 20.6 acres. The increased run-off from this paved area will be collected into the existing storm drain system and no physical changes are expected to alter the existing drainage pattern, storm water collection or wastewater treatment of their facility.

Therefore, PR 1420.2 is not expected to have significant adverse effects on any existing drainage patterns, or cause an increase rate or amount of surface runoff water that would exceed the capacity of the facilities' existing or planned storm water drainage systems.

IX. e) & f) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Ambient air monitors may be placed off-site in the surrounding industrial area. All construction activities would occur on-site at the existing facilities. Therefore, PR 1420.2 is not expected to result in placing housing or structures in 100-year flood hazard areas that could create new flood hazards or create significant adverse risk impacts from flooding as a result of failure of a levee or dam or inundation by seiches, tsunamis, or mudflows.

IX. g) The potential increase in wastewater volume generated by the proposed amendments is well within the existing and projected overall capacity of POTWs in the district. Therefore, wastewater impacts associated with the disposal of waterborne clean-up waste material generated from implementing the proposed amendments are not expected to significantly adversely affect POTW operations.

IX. h) Using the assumption from facilities that already comply with similar housekeeping requirements[9] and compliance plan activities, the 13 facilities may use an additional 82,372 gallons/day and 5 facilities may use an additional 82,372 gallons/day for their Compliance Plans (see Appendix B for details).

[8] According to Los Angeles County Sanitation District- (June 28, 2013).

[9] Housekeeping operations include street sweeping, watering, and washing the facility.

Table 2-10: PR 1420.2 Additional Water Consumption

Water Application	Additional Water Usage (gal/day)
Housekeeping Measures	82,372
Compliance Plan Usage	82,372
Total:	164,744
Significance Threshold:	262,820
Exceed Significance Threshold?	**No**

Therefore, the total additional use would be 164,372 gal/day of water, which is less than the significance threshold of 262,820 gal/day of potable water and total water demand of more than five million gallons per day. Therefore, sufficient water supplies are expected to be available to serve the project from existing entitlements and resources without the need for new or expanded entitlements. Therefore, PR 1420.2 is not expected to be significant for operational water demand.

IX. i) Staff estimates the additional water usage from the facilities' housekeeping activities and compliance plan activities are expected to be 82,372 gal/year from facilities that are capable of handling the waste water from these activities. The facilities that do not have a wastewater treatment system may choose to vacuum/sweep their facility.

If the proposed project does trigger a facilities' wastewater discharge rate, the POTW may deem that a secondary peak permit could be required to allow the discharge during non-peak hours. Significance thresholds for industrial wastewater discharge are determined by its impact to the affected sewer system.

Therefore, based on the above analysis, there would be adequate capacity to serve the proposed project's projected demand addition to the provider's existing commitments.

Based upon these considerations, significant adverse hydrology and water quality impacts are not anticipated and, therefore, no further analysis is required or necessary.

X. LAND USE AND PLANNING.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☑
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the	☐	☐	☐	☑

general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Significance Criteria
Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by local jurisdictions.

Discussion
X. a) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Therefore, PR 1420.2 is not expected to physically divide an established community.

X. b) There are no provisions in PR 1420.2 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by PR 1420.2.

Based upon these considerations, significant land use planning impacts are not expected from the implementation of the proposed project. Further, since no significant impacts were identified for any of these issues, no mitigation measures are necessary or required.

XI. MINERAL RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☑

Significance Criteria
Project-related impacts on mineral resources will be considered significant if any of the following conditions are met:

- The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

- The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Discussion

XI. a) & b) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. There are no provisions in PR 1420.2 that would result in the loss of availability of a known mineral resource of value to the region and the residents of the state such as aggregate, coal, clay, shale, et cetera, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Based upon these considerations, significant mineral resource impacts are not expected from the implementation of the proposed project. Since no significant mineral resource impacts were identified for any of these issues, no mitigation measures are necessary or required.

XII. NOISE.

Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of permanent noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
d) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public use airport or private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

Significance Criteria

Impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion

XII. a), b), & c) The facilities affected by PR1420.2 are currently located in urbanized industrial or commercial areas. The existing noise environment at each of the facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting facility premises. The majority of the facilities are completely paved and large potentially noise intensive construction equipment would not be needed to build enclosures and install control equipment. For the two sites which have surfaces to be paved, the use of large construction equipment is also not anticipated due to the on-site space limitations. Since the facilities are located in industrial areas, which have a higher background noise level when compared to other areas, the noise generated during construction will likely be indistinguishable from the background noise levels.

PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. The construction of enclosures would decrease the noise currently being generated on-site. Pollution control devices are not typically equipment that generate substantial amounts of noise. Due to the attenuation rate of noise based on distance from the source, it is unlikely that noise levels exceeding local noise ordinances would occur beyond a facility's boundaries. Furthermore, the Occupational Safety and Health Administration (OSHA) and California-OSHA (Cal/OSHA) have established noise standards to protect worker health. Furthermore, compliance with local noise ordinances limiting the hours of construction will reduce the temporary noise impacts from construction to sensitive receptors. These potential noise increases are expected to be within the allowable noise levels established by the local noise ordinances for industrial areas, and thus are expected to be less than significant.

XII. d) Two of the facilities are located within two miles of a public airport. Senior Aerospace is located approximately 0.6 miles east of the Burbank Airport but is not located within the airport influence area. Teledyne Battery Products is located approximately 1.7 miles southeast of the San Bernardino International Airport but is not within the airport safety review area. ~~It is not known if the existing facilities are located within an airport land use plan, or within two miles of a public airport.~~ However, compliance with PR 1420.2 would not expose people residing or working in the project area to excessive noise levels.

Based upon these considerations, significant noise impacts are not expected from the implementation of the proposed project. Further, since no significant impacts were identified for any of these issues, no mitigation measures are necessary or required.

XIII. POPULATION AND HOUSING.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Significance Criteria

Impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion

XIII. a) PR 1420.2 would require the installation of pollution control equipment, require the placement of ambient air quality monitors, construction of total enclosures, additional APCDs, implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. The facilities may need 1 new employee each to comply with the housekeeping and maintenance requirements in PR 1420.2. The facilities may also need temporary construction workers during the installation of the total enclosure and the pollution control equipment. It is expected that new permanent workers and any construction workers would come from the local labor pool in Southern California. Any new pollution control equipment is expected to be operated by qualified existing employees at the facilities. The proposed project is not anticipated to generate any significant effects, either direct or indirect, on the district's population or population distribution. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing PR 1420.2. As such, PR 1420.2 would not result in changes in population densities or induce significant growth in population.

XIII. b) Because PR 1420.2 affects operations at existing lead melting facilities, PR 1420.2 is not expected to result in the creation of any industry that would affect population growth, directly or indirectly, induce the construction of single- or multiple-family units, or require the displacement of people elsewhere.

Based upon these considerations, significant adverse population and housing impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

XIV. PUBLIC SERVICES.

Would the proposal result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:	**Potentially Significant Impact**	**Less Than Significant With Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Fire protection?	☐	☐	☐	☑
b) Police protection?	☐	☐	☐	☑
c) Schools?	☐	☐	☐	☑
d) Other public facilities?	☐	☐	☐	☑

Significance Criteria

Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion

XIV. a) & b) PR 1420.2 would require the installation of pollution control equipment, require the placement of ambient air quality monitors, construction of total enclosures, implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas, all the while continuing current operations at existing facilities. The proposed project may result in a greater demand for catalyst, scrubbing agents and other chemicals, which will need to be transported to the facilities to support the function of toxic emissions control equipment and stored onsite prior to use. As first responders to emergency situations, police and fire departments may assist local hazmat teams with containing hazardous materials, putting out fires, and controlling crowds to reduce public exposure to releases of hazardous materials. In addition, emergency or rescue vehicles operated by local, state, and federal law enforcement agencies, police and sheriff departments, fire departments, hospitals, medical or paramedic facilities, that are used for responding to situations where potential threats to life or property exist, including, but not limited to fire, ambulance calls, or life-saving calls, may be needed in the event of an accidental release or other emergency. While the specific nature or degree of such impacts is currently unknown, the facilities have existing emergency response plans so any changes to those plans would not be expected to dramatically alter how emergency personnel would respond to an accidental release or other emergency. In addition, due the low probability and unpredictable nature of accidental releases, the proposed project is not expected to increase the need or demand for additional public services (e.g., fire and police departments and related emergency services, et cetera) above current levels.

XIV. c) As noted in the previous "Population and Housing" discussion, the proposed project is not expected to induce population growth in any way because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any construction activities that may be necessary at facilities. The additional employee anticipated to be needed to implement the housekeeping and maintenance provisions at each facility will also likely be drawn from the local labor pool. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

XIV. d) PR 1420.2 would require the installation of pollution control equipment, require the placement of ambient air quality monitors, construction of total enclosures, implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Besides permitting the equipment or altering permit conditions by the SCAQMD, there is no need for other types of government services. The proposed project would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There will be no increase in population and, therefore, no need for physically altered government facilities.

Based upon these considerations, significant public services impacts are not expected from the implementation of the proposed project. Since no significant public services impacts were identified for any of these issues, no mitigation measures are necessary or required.

XV. RECREATION.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment or recreational services?	☐	☐	☐	☑

Significance Criteria

Impacts to recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

Discussion

XV. a) & b) As discussed earlier under the topic of "Population and Housing," there are no provisions in P 1420.2 that would affect or increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or the expansion of existing recreational facilities that might have an adverse physical effects on the environment because the proposed project will not directly or indirectly increase or redistribute population.

Based upon these considerations, significant recreation impacts are not expected from the implementation of PR 1420.2. Since no significant recreation impacts were identified, no mitigation measures are necessary or required.

XVI. SOLID/HAZARDOUS WASTE.

Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☑	☐
b) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	☐	☐	☑	☐

Significance Criteria

The proposed project impacts on solid/hazardous waste will be considered significant if the following occurs:

- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

XVI.a) Landfills are permitted by the local enforcement agencies with concurrence from the California Department of Resources Recycling and Recovery (CalRecycle). Local agencies establish the maximum amount of solid waste which can be received by a landfill each day and the operational life of a landfill.

Construction

PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. To comply with the proposed rule compliance plan, additional air pollution control equipment may be required. No demolition is expected from compliance with PR 1420.2; therefore, no solid waste will be generated during construction.

Operation

As noted in Table 2-11, operation of control equipment such as filters could have solid waste impacts.

This analysis of solid waste impacts assumes that safety and disposal procedures required by various agencies in the state of California will provide reasonable precautions against the improper disposal of hazardous wastes in a municipal waste landfill. Because of state and federal requirements, some facilities are attempting to reduce or minimize the generation of solid and hazardous wastes by incorporating source reduction technologies to reduce the volume or toxicity of wastes generated, including improving operating procedures, using less hazardous or nonhazardous substitute materials, and upgrading or replacing inefficient processes.

Filtration

Filtration includes usage of baghouse, HEPA filters. Mixed metal compounds could be captured with the use of filtration controls at a 99.9 percent control rate.

Currently, the facilities properly send their hazardous materials to their local melter or to Resource Conservation and Recovery Act (RCRA) landfill. It is estimated that the proposed rule's requirements of additional filters and APCDs may generate 5760 cubic yards/yr (8064 tons/yr) of hazardous waste.

The nearest RCRA landfills are the Republic Services and US Ecology. The Republic Services La Paz County Landfill has approximately 20,000,000 cubic yards of capacity remaining for the 50 year life expectancy (400,000 cubic yards per year). The US Ecology, Inc., facility in Beatty, Nevada has approximately 638,858 cubic yards of capacity remaining for the three year life expectancy (212,952 cubic yards per year. US Ecology, Inc., receives approximately 18,000 cubic yards per year of waste, so 194,952 cubic yards per year (212,952 cubic yard/year – 18,000 cubic yard/year) would be available

With an annual disposal of 5,760 cubic yards of filters, spent lead, and metals, the total solid/hazardous waste impact from the proposed rule are 1.44 percent and 2.95 percent of the available Republic Services and US Ecology landfill capacity, respectively.

The amount of hazardous waste generated by the proposed project will not require new RCRA landfills and is not considered to be a substantial impact to existing landfill capacity. Therefore, potential hazardous waste impacts are not considered significant.

Table 2-11 Total Solid Waste Generation

Control Type	Potential # APC Devices	Annual Waste per Control Device (cubic yards)	Total Waste Generated (cubic yards/year)
Filtration	9	640	5,760
TOTAL WASTE GENERATED FROM PROPOSED PROJECT			**5,760 cubic yards/yr or 15.7cubic yards/day**

All new enclosures and control equipment are expected to be installed within the currently developed footprint at already existing facilities. Because the newly installed control equipment has a finite lifetime (approximately 20 years), it will ultimately have to be replaced at the end of its useful life. Affected equipment may be refurbished and used elsewhere or the scrap metal or other materials from replaced units has economic value and is expected to be recycled, so any solid or hazardous waste impacts specifically associated with the proposed project are expected to be minor. As a result, no substantial change in the amount or character of solid or hazardous waste streams is expected to occur.

XVI.b) It is assumed that facility operators at the facilities comply with all applicable local, state, or federal waste disposal regulations. Implementation of PR 1420.2 is not expected to interfere with any affected facility's ability to comply with applicable local, state, or federal waste disposal regulations. Since no significant solid/hazardous waste impacts were identified, no mitigation measures are required or necessary.

Based upon these considerations, significant adverse solid/hazardous waste impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

XVII. TRANSPORTATION/TRAFFIC.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☑
b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☑
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑

d) Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☑
e) Result in inadequate emergency access?	☐	☐	☐	☑
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☑

Significance Criteria

Impacts on transportation/traffic will be considered significant if any of the following criteria apply:

- Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.
- The need for more than 350 employees
- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day
- Increase customer traffic by more than 700 visits per day.

Discussion

XVII. a) & b)

Construction

As noted in the "Discussion" sections of the other environmental topics, compliance with PR 1420.2 may require construction activities for control equipment. It has been estimated to need 10 delivery and/or disposal trucks and 9 construction worker trips on a peak construction day (during the total enclosure phases). Construction onsite is not expected to affect on-site traffic or parking. The additional 10 construction trips are less than the significance threshold of 350 round trips, therefore construction activities are not expected to cause a significance adverse impact to traffic or transportation.

Operation

Waste products may be generated from the use of control technologies. Waste could include dry solids from filtration controls. The majority of wastes will likely need to be transported to disposal or recycling facilities.

For a "worst case" analysis, SCAQMD staff assumed that for the four facilities required to install an additional control device to comply with PR 1420.2 compliance plan, these facilities at any given day would generate an additional 2 truck trips per day in the entire district additional for delivery and disposal. Overall, there would be an additional 2 worker trips for collecting samples. These potential truck trips are not expected to significantly adversely affect circulation patterns on local roadways or the level of service at intersections near facilities. In addition, this volume of additional daily truck traffic is negligible over the entire area of the district. Finally, the number of waste disposal transport trips substantially overestimates the number of anticipated trips because owners/operators at facilities may use other types of add-on control equipment that do not generate wastes and the actual volume of wastes is expected to much less than estimated here, resulting in fewer truck trips per day.

Table 2-12 Estimation of Vehicle Trips

Phase	Worker Vehicles	Delivery/Disposal Trucks
Construction	9 per day	10 per day[a]
Operation	2 per day	2 per day[b]

[a] A maximum of 9 worker vehicles and 10 delivery/disposal trucks per day were estimated from two facilities peak construction

[b] A maximum of 2 worker trips for collecting samples. A maximum of 2 delivery/disposal trucks can travel in the District for the 4 Facilities

XVII. c) Two of the facilities are located within two miles of a public airport. Senior Aerospace is located approximately 0.6 miles east of the Burbank Airport but is not located within the airport influence area. Teledyne Battery Products is located approximately 1.7 miles southeast of the San Bernardino International Airport but is not within the airport safety review area. ~~It is not known whether the location of existing facilities could be located at sites within an airport land use plan, or within two miles of a public airport.~~ ~~However~~Additionally, any actions taken by the facilities to comply with PR 1420.2 is not expected to change the air traffic patterns or change in location that results in substantial safety risks.

XVII. d) & e) The proposed project does involve construction of roadways, but all of the roads would be on-site. Thus, there will no change to current public roadway designs that could increase traffic hazards. Thus, the proposed project is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the facilities. Emergency access at the facilities is not expected to be impacted by the proposed project. Further, each affected facility is expected to continue to maintain their existing emergency access. Since PR 1420.2 involves short-term construction activities and involves minor delivery/haul truck trips (street sweepings are on-site), the proposed project is not expected to alter the existing long-term circulation patterns. The proposed project is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur.

XVII. f) The facilities would still be expected to comply with, and not interfere with adopted policies, plans, or programs supporting alternative transportation (e.g. bicycles or buses). Since all of the PR 1420.2s' compliance activities would occur on-site, PR 1420.2 would not hinder compliance with any applicable alternative transportation plans or policies.

Based upon these considerations, significant adverse transportation/traffic impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☑
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☑	☐
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☑	☐

DISCUSSION

XVIII. a) As discussed in the "Biological Resources" section, PR 1420.2 is not expected to significantly adversely affect plant or animal species or the habitat on which they rely because any construction and operational activities associated with the facilities are expected to occur entirely within the boundaries of existing developed facilities in areas that have been greatly disturbed and that currently do not support any species of concern or the habitat on which they rely. PR 1420.2

is not expected to reduce or eliminate any plant or animal species or destroy prehistoric records of the past.

XVIII. b) Based on the foregoing analyses, PR 1420.2 would not result in significant adverse project-specific environmental impacts. Potential adverse impacts from implementing PR 1420.2 would not be "cumulatively considerable" as defined by CEQA Guidelines §15064(h)(1) for any environmental topic because there are no, or only minor incremental project-specific impacts that were concluded to be less than significant. Per CEQA Guidelines §15064(h)(4), the mere existing of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulative considerable. SCAQMD cumulative significant thresholds are the same as project-specific significance thresholds.

This approach was upheld by the Court in *Citizens for Responsible Equitable Environmental Development v. City of Chula Vista* (2011) 197 Cal. App. 4th 327, 334. The Court determined that where it can be found that a project did not exceed the South Coast Air Quality Management District's established air quality significance thresholds, the City of Chula Vista properly concluded that the project would not cause a significant environmental effect, nor result in a cumulatively considerable increase in these pollutants. The court found this determination to be consistent with CEQA Guidelines §15064.7, stating, "The lead agency may rely on a threshold of significance standard to determine whether a project will cause a significant environmental effect." The court found that, "Although the project will contribute additional air pollutants to an existing nonattainment area, these increases are below the significance criteria…" "Thus, we conclude that no fair argument exists that the Project will cause a significant unavoidable cumulative contribution to an air quality impact." As in *Chula Vista*, here the District has demonstrated, when using accurate and appropriate data and assumptions, that the project will not exceed the established South Coast Air Quality Management District significance thresholds. See also, *Rialto Citizens for Responsible Growth v. City of Rialto* (2012) 208 Cal. App. 4th 899. Here again the court upheld the South Coast Air Quality Management District's approach to utilizing the established air quality significance thresholds to determine whether the impacts of a project would be cumulatively considerable. Thus, it may be concluded that the Project will not cause a significant unavoidable cumulative contribution to an air quality impact.

Therefore, there is no potential for significant adverse cumulative or cumulatively considerable impacts to be generated by the proposed project for any environmental topic.

XVIII. c) Based on the foregoing analyses, PR 1420.2 is not expected to cause adverse effects on human beings for any environmental topic because the air quality impacts were determined to be less than the significance thresholds (See Section III-AQ), the energy demand, water demand and solid waste disposal can be met utilizing existing services (See Section VI-Energy, Section IX-Hydrology and Section XVI-Solid/Hazardous Waste) and the aesthetics, noise, hazards and public services will not be significantly impacted (See Section I-Aesthetics, Section VII-Hazards, Section XII-Noise, and Section XIV-Public Services).

As previously discussed in environmental topics I through XVIII, the proposed project has no potential to cause significant adverse environmental effects. Therefore, no further analysis or mitigation measures are required or necessary.

APPENDICES

APPENDIX A

PROPOSED RULE 1420.2

In order to save space and avoid repetition, please refer to the latest version of Proposed Rule 1420.2 located in the October 2, 2015 Governing Board Package. The version of Proposed Rule 1420.2 that was circulated with the Draft EA released on July 17, 2015 for a 32-day public review and comment period ending August 18, 2015 and the Revised Draft EA released on July 21, 2015 for a 30-day public review and comment period ending August 19, 2015 was "PR1420.2b" dated June 12, 2015.

Original hard copies of the Draft EA and Revised Draft EA, which include the draft version of the proposed rule listed above, can be obtained through the SCAQMD Public Information Center at the Diamond Bar headquarters or by calling (909) 396-2039.

APPENDIX B

ASSUMPTIONS AND CALCULATIONS

Table B-1
Paving Emissions

Asphalt Paving of Roads		
Worse-Case:	**20 acres**	
Construction Schedule	**20**	**days[a]**

Equipment Type[a]	**No. of Equipment**	**hr/day**	**Crew Size**
Pavers	1	7.0	10
Cement and Mortar Mixers	4	6.0	
Rollers	1	7.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
Equipment Type[b]	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Pavers	0.526	0.810	0.056	0.052	0.143	0.001	78	0.013	0.000
Cement and Mortar Mixers	0.042	0.055	0.002	0.002	0.009	0.000	7	0.001	0.000
Rollers	0.401	0.616	0.042	0.039	0.091	0.001	67	0.008	0.000
Tractors/Loaders/Backhoes	0.374	0.498	0.034	0.031	0.073	0.001	67	0.007	0.000

Construction Vehicle (Mobile Source) Emission Factors[c]

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Automobile	4.12E-03	3.41E-04	1.04E-04	4.41E-05	4.50E-04	8.22E-06	0.73	2.01E-05	4.83E-06
Heavy-Duty Truck	3.98E-03	1.81E-02	5.40E-04	3.85E-04	7.84E-04	3.64E-05	3.76	3.64E-05	2.56E-04

Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Worker	10	20
Delivery Truck[d]	3	40

Table B-1 (Continued)
Paving Emissions

Incremental Increase in Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Construction Emissions (lb/day)

Equipment Type	**CO** lb/day	**NOx** lb/day	**PM10** lb/day	**PM2.5** lb/day	**VOC** lb/day	**SOx** lb/day	**CO2** lb/day	**CH4** lb/day	**N2O** lb/day
Pavers	3.68	5.67	0.39	0.36	0.1	0.00	51	0.01	0.00
Cement and Mortar Mixers	9.63	14.78	1.01	0.93	0.6	0.01	469	0.06	0.00
Rollers	0.29	0.39	0.02	0.02	0.0	0.00	0	0.00	0.00
Tractors/Loaders/Backhoes	2.62	3.48	0.24	0.22	0.0	0.00	0	0.00	0.00
Total	**16**	**24**	**1.66**	**1.52**	**0.70**	**0.01**	**520**	**0.06**	**0.00**

Incremental Increase in Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	**CO** lb/day	**NOx** lb/day	**PM10** lb/day	**PM2.5** lb/day	**VOC** lb/day	**SOx** lb/day	**CO2** lb/day	**CH4** lb/day	**N2O** lb/day
Worker	1.649	0.137	0.0415	0.0177	0.1801	0.0033	291.3421	0.0080	0.0019
Delivery	0.956	4.346	0.1297	0.0923	0.1882	0.0087	901.2773	0.0087	0.0615
Total	**2.604**	**4.482**	**0.1712**	**0.1100**	**0.3683**	**0.0120**	**1192.6193**	**0.0168**	**0.0635**

Total Incremental Combustion Emissions from Construction Activities

Sources	**CO** lb/day	**NOx** lb/day	**PM10** lb/day	**PM2.5** lb/day	**VOC** lb/day	**SOx** lb/day	**CO2eq** metric ton/year
Emissions	**19**	**29**	**1.8**	**1.6**	**1.1**	**0.0**	**15.7**
Significance Threshold[e]	**550**	**100**	**150**	**55**	**75**	**150**	
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Table B-1 (Continued)
Paving Emissions

Notes:

a) Estimated construction equipment assumed to operate one eight-hour shift per day.

b) Emission factors estimated using OFFROAD2011

c) Emission factors estimated using EMFAC2011 for the 2015 fleet year.

d) Assumed three deliver truck trips per day.

e) SCAQMD CEQA significance thresholds

Table B-2
Foundation Emissions

Foundation		
Construction Schedule	**5**	**days[a]**

Equipment Type[a]	**No. of Equipment**	**hr/day**	**Crew Size**
Pavers	1	7.0	10
Cement and Mortar Mixers	4	6.0	
Rollers	1	7.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
Equipment Type[b]	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Pavers	0.526	0.810	0.056	0.052	0.143	0.001	78	0.013	0.000
Cement and Mortar Mixers	0.042	0.055	0.002	0.002	0.009	0.000	7	0.001	0.000
Rollers	0.401	0.616	0.042	0.039	0.091	0.001	67	0.008	0.000
Tractors/Loaders/Backhoes	0.374	0.498	0.034	0.031	0.073	0.001	67	0.007	0.000

Construction Vehicle (Mobile Source) Emission Factors[c]

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Automobile	4.12E-03	3.41E-04	1.04E-04	4.41E-05	4.50E-04	8.22E-06	0.73	2.01E-05	4.83E-06
Heavy-Duty Truck	3.98E-03	1.81E-02	5.40E-04	3.85E-04	7.84E-04	3.64E-05	3.76	3.64E-05	2.56E-04

Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Worker	10	20
Delivery Truck[d]	3	40

Table B-2 (Continued)
Foundation Emissions

Incremental Increase in Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Construction Emissions (lb/day)

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pavers	3.68	5.67	0.39	0.36	0.1	0.00	51	0.01	0.00
Cement and Mortar Mixers	9.63	14.78	1.01	0.93	0.6	0.01	469	0.06	0.00
Rollers	0.29	0.39	0.02	0.02	0.0	0.00	0	0.00	0.00
Tractors/Loaders/Backhoes	2.62	3.48	0.24	0.22	0.0	0.00	0	0.00	0.00
Total	**16**	**24**	**1.66**	**1.52**	**0.70**	**0.01**	**520**	**0.06**	**0.00**

Incremental Increase in Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Worker	1.649	0.137	0.0415	0.0177	0.1801	0.0033	291.3421	0.0080	0.0019
Delivery	0.956	4.346	0.1297	0.0923	0.1882	0.0087	901.2773	0.0087	0.0615
Total	**2.604**	**4.482**	**0.1712**	**0.1100**	**0.3683**	**0.0120**	**1192.6193**	**0.0168**	**0.0635**

Total Incremental Combustion Emissions from Construction Activities

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2eq**
Sources	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	metric ton/year
Emissions	**19**	**29**	**1.8**	**1.6**	**1.1**	**0.0**	**3.9**
Significance Threshold[e]	***550***	***100***	***150***	***55***	***75***	***150***	
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Table B-2 (Continued)
Foundation Emissions

Notes:

a) Estimated construction equipment assumed to operate one eight-hour shift per day.

b) Emission factors estimated using OFFROAD2011

c) Emission factors estimated using EMFAC2011 for the 2015 fleet year.

d) Assumed three deliver truck trips per day.

e) SCAQMD CEQA significance thresholds

Table B-3
Installation of APCD Emissions

Construction of APC		
Construction Schedule	21	days

Equipment Type[a]	**No. of Equipment**	**hr/day**	**Crew Size**
Cranes	2	4.0	10
Forklifts	2	6.0	
Tractors/Loaders/Backhoes	1	8.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
Equipment Type[b]	lb/hr	lb/hr	lb/hr		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Cranes	0.431	1.028	0.044	0.041	0.120	0.001	121	0.011	0.043
Forklifts	0.221	0.355	0.018	0.016	0.050	0.001	54	0.004	0.015
Tractors/Loaders/Backhoes	0.374	0.498	0.034	0.031	0.073	0.001	67	0.007	0.021

Construction Vehicle (Mobile Source) Emission Factors[c]

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Automobile	4.12E-03	3.41E-04	1.04E-04	4.41E-05	4.50E-04	8.22E-06	0.73	2.01E-05	4.83E-06
Heavy-Duty Truck	3.98E-03	1.81E-02	5.40E-04	3.85E-04	7.84E-04	3.64E-05	3.76	3.64E-05	2.56E-04

Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Worker	10	20
Heavy-duty Trucks	3	40

Table B-3 (Continued)
Installation of APCD Emissions

Incremental Increase in Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Construction Emissions (lb/day)

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	N2O
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Cranes	3.5	8.2	0.35	0.33	1.0	0.01	967	0.09	0.34
Forklifts	2.7	4.3	0.21	0.20	0.60	0.01	652	0.05	0.18
Tractors/Loaders/Backhoes	3.0	4.0	0.27	0.25	0.58	0.01	534	0.05	0.17
Total	**9.1**	**16.5**	**0.8**	**0.8**	**2.1**	**0.02**	**2,154**	**0.19**	**0.68**

Incremental Increase in Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	N2O
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Flatbed Trucks	1.59	7.2	0.216	0.154	0.314	1.45E-02	1,502	0.0146	0.1026
Water Trucks	0.96	4.3	0.13	0.092	0.19	9.00E-03	901	0.009	0.062
Total	**2.5**	**11.6**	**0.35**	**0.25**	**0.50**	**2.35E-02**	**2,403**	**0.024**	**0.165**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2eq
Sources	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	metric ton/year
Emissions	**12**	**28**	**1.2**	**1.0**	**2.6**	**0.0**	**438**
Significance Threshold[e]	***550***	***100***	***150***	***55***	***75***	***150***	
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Table B-3 (Continued)
Installation of APCD Emissions

Notes:

a) Estimated construction equipment assumed to operate one eight-hour shift per day.
b) Emission factors estimated using
OFFROAD2011

c) Emission factors estimated using EMFAC2011 for the 2015 fleet year.

d) Assumed three deliver truck trips per day.

e) SCAQMD CEQA significance thresholds

Table 4
Total Enclosures Construction Emissions

Enclosures

Assumptions Largest total enclosure needed

Building	Width, m	Length, m	Height, m	Area, ft2	Area, acre	Construction Days	Construction Months
Total Enclosure	125	250	75	31,250	0.72	54.3	2.5

Example	**Construction Activity**					
	Total Enclosure	31,250	Square Foot Structure	Duration	55	days

Construction Schedule Unknown

Equipment Type[a,b]	No. of Equipment	hr/day	Crew Size
Forklifts	2	7.0	9
Cranes	2	8.0	
Tractors/Loaders/Backhoes	2	6.0	
Generator Sets	2	8.0	
Electric Welders	4	8.0	

Construction Equipment Combustion Emission Factors

Equipment Type[c]	**CO** lb/hr	**NOx** lb/hr	**VOC** lb/hr	**SOX** lb/hr	**PM10** lb/hr	**PM2.5** lb/hr	**CO2** lb/hr	**CH4** lb/hr	**N2O** lb/hr
Forklifts	0.232	0.516	0.069	0.001	0.028	0.026	54.4	0.006	0.006
Cranes	0.543	1.451	0.159	0.001	0.064	0.059	128.7	0.014	0.014
Tractors/Loaders/Backhoes	0.393	0.675	0.102	0.001	0.052	0.048	66.8	0.009	0.009
Generator Sets	0.329	0.644	0.096	0.001	0.040	0.036	61.0	0.009	0.008
Electric Welders	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 4 (Continued)
Total Enclosures Construction Emissions

Construction Vehicle (Mobile Source) Emission Factors

	CO	NOx	VOC	SOX	PM10	PM2.5	CO2	CH4	N2O
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.01195456	0.03822102	0.00304157	0.00004131	0.00183062	0.00160083	4.21120578	0.00014201	0.00001058
Worker Vehicles	0.00826276	0.00091814	0.00091399	0.00001077	0.00008698	0.00005478	1.09568235	0.00008146	0.00010753

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Flatbed Truck[e]	10	40
Construction Workers	9	20

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	VOC	SOX	PM10	PM2.5	CO2	CH4	N2O
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Fork Lifts	3.25	7.23	0.96	0.01	0.39	0.36	762	0.09	0.08
Cranes	8.69	23.22	2.55	0.02	1.03	0.95	2,058	0.23	0.22
Tractors/Loaders/Backhoes	4.72	8.10	1.22	0.009	0.62	0.57	802	0.11	0.10
Generator Sets	5.27	10.30	1.54	0.01	0.63	0.58	976	0.14	0.13
Electric Welders	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	**21.9**	**48.9**	**6.3**	**0.05**	**2.7**	**2.5**	**4,598**	**0.57**	**0.53**

Table 4 (Continued)
Total Enclosures Construction Emissions

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	**NOx**	**VOC**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Flatbed Truck	9.56	30.6	2.43	0.0330	1.46	1.28	3,369	0.11	0.01
Worker Vehicles	2.97	0.33	0.33	0	0.03	0.02	394	0.03	0.04
Total	**12.5**	**30.9**	**2.76**	**0.03**	**1.49**	**1.30**	**3,763**	**0.14**	**0.05**

Total Incremental Combustion Emissions from Construction Activities

	CO	**NOx**	**VOC**	**SOX**	**PM10**	**PM2.5**	**CO2**[g]	**CH4**[g]	**N2O**[g]
Sources	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	Mton/project/ 30 yrs	Mton/project/ 30 yrs	Mton/project/ 30 yrs
On-Site Emissions	**34**	**80**	**9.0**	**0.08**	**4.2**	**3.8**	**7**	**0.001**	**0.000**
Significance Threshold[f]	***550***	***100***	***75***	***150***	***150***	***55***	10,000 Mton/year	10,000 Mton/year	10,000 Mton/year
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**			

Notes:

a) Assumption

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator. N2O values estimated from ratio of N2O and CH4 EF presented for on-road vehicles
in the ARB Regulation for Mandatory Reporting of GHG Emissions.

d) 2010 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html. N2) values from ARB Regulation for Mandatory Reporting of GHG Emissions.

e) Assumed haul truck travels 40 miles round trip

f) SCAQMD Regional Significance Thresholds

g) GHG are reported in metric tons (Mton) over 30 years.

Table B-5
Installation of Blowers Emissions

Installation of blowers		
Construction Schedule	5	days

Equipment Type[a]	**No. of Equipment**	**hr/day**	**Crew Size**
Cranes	1	4.0	10
Forklifts	2	6.0	
Tractors/Loaders/Backhoes	1	8.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
Equipment Type[b]	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Cranes	0.431	1.028	0.044	0.041	0.120	0.001	121	0.011	0.043
Forklifts	0.221	0.355	0.018	0.016	0.050	0.001	54	0.004	0.015
Tractors/Loaders/Backhoes	0.374	0.498	0.034	0.031	0.073	0.001	67	0.007	0.021

Construction Vehicle (Mobile Source) Emission Factors[c]

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**N2O**
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Automobile	4.12E-03	3.41E-04	1.04E-04	4.41E-05	4.50E-04	8.22E-06	0.73	2.01E-05	4.83E-06
Heavy-Duty Truck	3.98E-03	1.81E-02	5.40E-04	3.85E-04	7.84E-04	3.64E-05	3.76	3.64E-05	2.56E-04

Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Worker	10	20
Heavy-duty Truck[d]	3	40

Table B- 5 (Continued)
Installation of Blowers Emissions

Incremental Increase in Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Construction Emissions (lb/day)

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	N2O
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Cranes	1.7	4.1	0.18	0.16	0.5	0.01	484	0.04	0.17
Forklifts	2.7	4.3	0.21	0.20	0.60	0.01	652	0.05	0.18
Tractors/Loaders/Backhoes	3.0	4.0	0.27	0.25	0.58	0.01	534	0.05	0.17
Total	**7.4**	**12.3**	**0.7**	**0.6**	**1.7**	**0.02**	**1,670**	**0.15**	**0.51**

Incremental Increase in Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	N2O
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Flatbed Trucks	1.59	7.2	0.216	0.154	0.314	1.45E-02	1,502	0.0146	0.1026
Water Trucks	0.96	4.3	0.13	0.092	0.19	9.00E-03	901	0.009	0.062
Total	**2.5**	**11.6**	**0.35**	**0.25**	**0.50**	**2.35E-02**	**2,403**	**0.024**	**0.165**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2eq
Sources	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	metric ton/year
Emissions	**10**	**24**	**1.0**	**0.9**	**2.2**	**0.0**	**389**
Significance Threshold[e]	***550***	***100***	***150***	***55***	***75***	***150***	
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Notes:

a) Estimated construction equipment assumed to operate one eight-hour shift per day.

b) Emission factors estimated using OFFROAD2011

c) Emission factors estimated using EMFAC2011 for the 2015 fleet year.

d) Assumed three deliver truck trips per day.

e) SCAQMD CEQA significance thresholds

Table B-6
Operational Emissions (Mobile Sources)

Operational

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	N2O
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Automobile	4.12E-03	3.41E-04	1.04E-04	4.41E-05	4.50E-04	8.22E-06	0.73	2.01E-05	4.83E-06
Heavy-Duty Truck[a]	3.98E-03	1.81E-02	5.40E-04	3.85E-04	7.84E-04	3.64E-05	3.76	3.64E-05	2.56E-04

Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Automobile (Source Test)	1	20
Heavy-duty Truck	1	200

Incremental Increase in Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	N2O
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Automobile (Source Test)	0.16	0.01	0.0042	0.0018	0.02	0.0003	29	0.0008	4.83E-06
Haul Truck	1.6	7.2	0.216	0.154	0.31	0.0145	1,502	0.0146	0.103

Total Incremental Emissions from Operational Activities

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2
Sources	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	metric ton/year
Emissions	**1.8**	**7.3**	**0.2**	**0.2**	**0.3**	**0.01**	**0.71**
Significance Threshold[b]	***550***	***55***	***150***	***55***	***75***	***150***	***10,000***
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Table B-7
Vehicle Sweeping Emissions

All Facilities	Area (ft^2)	Area (acres)	Width of Sweeper Path (ft)	Linear Feet Traveled (ft)	Linear Feet Traveled (miles)
Total	1,700,000	39.0	7	242,857	46.0

Assumed sweepers are nine feet wide with two foot overlap

Description	**CO, lb/mile**	**NOx, lb/mile**	**VOC, lb/mile**	**SOX, lb/mile**	**PM10, lb/mile**	**PM2.5, lb/mile**	**CO2, lb/mile**	**CH4, lb/mile**	**N2O, lb/mile**
Medium-Duty Truck	0.018438	0.020625	0.002590	0.000027	0.000751	0.000642	2.732222	0.000126	0.000011

Both Facilities Roundtrip

Description	**VMT, mile/day**	**CO, lb/day**	**NOx, lb/day**	**VOC, lb/day**	**SOX, lb/day**	**PM10, lb/day**	**PM2.5, lb/day**	**CO2, Mton/year**	**CH4, Mton/year**	**N2O, Mton/year**	**CO2eq, Mton/year**
Medium-Duty Truck	92.0	1.70	1.90	0.24	0.0025	0.069	0.0591	41.6	0.0019	0.000161	41.6
Medium-Duty Truck For 5 facilities	35.4	0.65	0.73	0.09	0.0010	0.027	0.0227	16.0	0.0007	0.000062	16.0

All EF from EMFAC2007, N2O from ARB's Regulation for the Mandatory Reporting of Greenhouse Gases,

Table B-8
Ambient Monitoring Vehicle Emissions

Assumption: Two facilities per day

	CO	NOx	VOC	SOX	PM10	PM2.5	CO2	CH4	N2O
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Gasoline Vehicles	0.00826276	0.00091814	0.00091399	0.00001077	0.00008698	0.00005478	1.09568235	0.00008146	0.00010753

Description	VMT, mile/day	CO, lb/day	NOx, lb/day	VOC, lb/day	SOX, lb/day	PM10, lb/day	PM2.5, lb/day	CO2, Mton/year	CH4, Mton/year	N2O, Mton/year	CO2eq, Mton/year
Gasoline vehicle	160	1.32	0.15	0.15	0.0017	0.014	0.0088	14.5	0.0011	0.001424	14.5

Table B-9
Aerial Lift Usage and Delivery Emissions

	CO	NOx	VOC	SOx	PM10	PM2.5	CO2	CH4	N2O
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Aerial Lifts	0.209304495	0.360045405	0.066987904	0.000399208	0.02478674	0.02	34.7	0.0060	0.006

Usage, hr/day	CO, lb/day	NOx, lb/day	VOC, lb/day	SOX, lb/day	PM10, lb/day	PM2.5, lb/day	CO2, Mton/year	CH4, Mton/year	N2O, Mton/year
6	1.26	2.16	0.40	0.002	0.15	0.14	11.3	0.0004	0.0007

	CO	NOx	VOC	SOX	PM10	PM2.5	CO2	CH4	N2O
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck	0.01195456	0.03822102	0.00304157	0.00004131	0.00183062	0.00160083	4.21120578	0.00014201	0.00001058

Description	VMT, mile/day	CO, lb/day	NOx, lb/day	VOC, lb/day	SOX, lb/day	PM10, lb/day	PM2.5, lb/day	CO2, Mton/year	CH4, Mton/year	N2O, Mton/year
Heavy-Duty Truck	80.0	0.96	3.06	0.24	0.00	0.15	0.13	15.3	0.0005	0.000038

Table B-10
Estimated Water Usage

Facility	Size of Building Housing Furnaces (sq. ft)	Bldg Ht (ft)	Total Size of All Buildings (sq. ft)	Total Facility Size (sq. ft)	Facility Size w/Buidlings Backed out (sq. ft)	one time per day (gpd)
A	9350	30	8350	61,194	52,844	3,801
B	47250	30	91000	159,600	68,600	9,913
C	6750	30	14575	75,000	60,425	4,658
D				4,842,500	1,000,000	0
E	43500	30	43500	82,775	39,275	5,141
F	50600	30	64500	169,275	104,775	10,514
G	18175	30	18175	32,175	14,000	1,998
H	4500	30	4500	151,940	147,440	9,437
I	30750	30	88100	157100	69,000	9,758
J	27000	30	107800	173250	65,450	10,761
K	12000	20	16900	53000	36,100	3,292
L	3375	20	7625	25625	18,000	1,592
M	16000	30	100675	185250	84,575	11,506
				Total	1,760,484	82,372

Table B-11
Fuel Use

Building/Installation of APCD

Schedule 21 **days**

Equipment Type	No. of Equipment	Op Time, hr/day	Fuel Economy, gal/hr	Fuel Used, gal/day
Cranes	3	4.0	3.52	42.24
Forklifts	2	6.0	0.96	11.52
Tractors/Loaders/Backhoes	2	8.0	1.9	30.4

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Automobile	10	20	10	40
Heavy-duty Truck	3	40	40	6

Total Diesel Used for Phase	1767.36	**gal/phase**

Total Diesel Used for Phase	126	**gal/phase**
Total Gasoline Used for Phase	840	**gal/phase**

Building/Installation of Blowers

Schedule 5 **days**

Equipment Type	No. of Equipment	Op Time, hr/day	Fuel Economy, gal/hr	Fuel Used, gal/day
Cranes	1	4.0	3.52	14.08
Forklifts	2	6.0	0.96	11.52
Tractors/Loaders/Backhoes	1	8.0	1.9	15.2

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Automobile	10	20	10	40
Heavy-duty Truck	3	40	40	6

Total Diesel Used for Phase	204	**gal/phase**

Total Diesel Used for Phase	30	**gal/phase**
Total Gasoline Used for Phase	200	**gal/phase**

Paving of Roads

Schedule 14 **days**

Equipment Type	No. of Equipment	Op Time, hr/day	Fuel Economy, gal/hr	Fuel Used, gal/day
Pavers	1	7.0	2.8	19.6
Cement and Mortar Mixers	4	6.0	0.331	7.944
Rollers	1	7.0	1.6	11.2
Tractors/Loaders/Backhoes	1	7.0	1.9	13.3

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Automobile	10	20	10	40
Heavy-duty Truck	3	40	40	6

Total Diesel Used for Phase	728.616	**gal/phase**

Total Diesel Used for Phase	84	**gal/phase**
Total Gasoline Used for Phase	560	**gal/phase**

Foundation

Schedule 5 days

Equipment Type	No. of Equipment	Op Time, hr/day	Fuel Economy, gal/hr	Fuel Used, gal/day
Pavers	1	7.0	2.8	19.6
Cement and Mortar Mixers	4	6.0	0.331	7.944
Rollers	1	7.0	1.6	11.2
Tractors/Loaders/Backhoes	1	7.0	1.9	13.3

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Automobile	10	20	10	40
Heavy-duty Truck	3	40	40	6

Total Diesel Used for Phase	260.22	**gal/phase**

Total Diesel Used for Phase	30	**gal/phase**
Total Gasoline Used for Phase	200	**gal/phase**

Total Enclosures

Schedule 66 **days**

Equipment Type	No. of Equipment	Op Time, hr/day	Fuel Economy, gal/hr	Fuel Used, gal/day
Forklifts	2	7.0	2.5	35
Cranes	2	8.0	3.5	56
Tractors/Loaders/Backhoes	2	6.0	1.9	23
Generator Sets	2	8.0	2.8	45

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Automobile	9	20	10	36
Heavy-duty Truck	10	40	40	20

Total Diesel Used for Phase	8157.60	**gal/phase**

Total Diesel Used for Phase	1320	**gal/phase**
Total Gasoline Used for Phase	2376	**gal/phase**

Grand Total Diesel Used	11117.80	**gal/project**

Grand Total Diesel Used	1590.00	**gal/project**
Grand Total Gasoline Used	4176	**gal/project**

Diesel Use (Equipment + Vehicles)	**12707.80**	**gal/project**

A P P E N D I X C

COMMENT LETTER AND RESPONSES TO COMMENTS

INTRODUCTION

A Draft Environmental Assessment (EA) was released for a 32-day public review and comment period from July 17, 2015 to August 18, 2015. Subsequently, a Revised Draft EA, which included formatting changes to Appendix B, was released for a 30-day public review and comment period from July 21, 2015 to August 19, 2015. The environmental analysis in the Draft EA and Revised Draft EA concluded that PR 1420.2 would not generate any significant adverse environmental impacts. The SCAQMD received one comment letter regarding the environmental analysis in the Draft EA during the public comment period.

The individual comments within the comment letter have been bracketed and numbered. Following each comment is SCAQMD staff's response.

GERDAU

August 19, 2015

Via First Class mail and
Via Email to: ccarter@aqmd.gov

Ms. Cynthia Carter, c/o CEQA
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4182

Re: Comments on Draft Environmental Assessment for Proposed Rule 1420.2

Dear Ms. Carter:

Our Rancho Cucamonga facility is one of only thirteen facilities that will be regulated by Proposed Rule 1420.2. As such, we have first-hand knowledge regarding the regulated equipment and activities, insight into the challenges of compliance, and potential environmental and economic impacts. We appreciate the opportunity to comment on the Draft Environmental Assessment prepared by the SCAQMD for Rule 1420.2. Our complete comments are attached. 1-1

Our greatest concern during the rule development process has been that the rule would contain technologically or economically infeasible provisions that would not produce meaningful emissions reductions in the community. We appreciate the time that District staff has taken to better understand our equipment, emissions, and business. We believe that the August 5, 2015 version of the rule is better for the community as well as for Gerdau. However, the Draft EA evaluates an earlier version of the proposed rule. If provisions of earlier versions of the rule were to be restored, or new requirements added prior to rule adoption, the rule would very likely cause the closure of the Rancho Cucamonga facility. In such case, the Draft EA would be deficient under CEQA, because it fails to evaluate the substantial environmental effects of facility closure. 1-2

Again, we appreciate the opportunity to provide comments on the draft EA. If you have any questions regarding our comments, please do not hesitate to contact me.

Sincerely,

Mark Olson, Vice President/General Manager
Rancho Cucamonga Mill
Gerdau Long Steel North America

GERDAU

DETAILED COMMENTS

PART I. GENERAL COMMENTS

1. Version of the Rule Reviewed

As originally proposed, Rule 1420.2 would have had a substantial negative effect on our plant in Rancho Cucamonga. Many of the requirements in the early versions of the rule would have been technologically infeasible. Other early provisions would have imposed extraordinary costs of compliance while having no or negligible benefit in reducing ambient lead concentrations in the community. As a result, the early versions of the rule would have caused the closure of the Rancho Cucamonga plant.

We realize that the staff continues to fine tune details regarding the proposed rule. Some of the issues described in our comments may be moot, with the release of the August 5, 2015 version of 1-3 the rule, and others may become moot with additional rule revisions prior to adoption. However, to comment on the Draft EA, it is necessary to comment in the context of the version of the rule reviewed in that document. If the adopted version of the rule excludes provisions in the June 12, 2015 version of the proposed rule for which the Draft EA is deficient, then the CEQA deficiency may be addressed (provided the change does not implicate other potentially significant impacts). Conversely, if the adopted rule includes provisions that were present in the earlier drafts of the rule but not in the June 12, 205 version evaluated in the Draft EA, or if new requirements are added, then CEQA Guidelines Section 15073.5 would require at a minimum that the Draft EA be revised and recirculated for public comment prior to adoption of the rule in order to evaluate additional adverse environmental impacts, including direct and indirect environmental impacts associated with closure of the Ranch Cucamonga facility.

2. The EA Should Be Revised to Evaluate the Current Proposed Rule.

As noted, the Draft EA analyzes the impacts of the June 12, 2015 version of the proposed rule. The proposed rule has been changed in important ways since that time. In order for the EA to achieve CEQA's objective of informing the public and the decision-makers about the environmental consequences of the proposed decision, the EA should be revised to include analysis of the latest version of the draft PR 1420.2. All edits made in the August 5, 2015 draft 1-4 PR 1420.2 need to be reflected in an updated Project Description section of the EA. In addition, the environmental analysis needs to be updated to account for additional project components as listed in the August 5, 2015 draft proposed rule. EA revision should occur before either the EA or the rule is presented to the Governing Board for adoption. In addition, it is expected that changes in response to these and other public comments will disclose for the first time that the rule may result in significant adverse environmental impacts. Therefore, a revised draft EA should be recirculated for public comment before adoption of the EA or the rule.

[redacted]/35807124v1

3. **<u>The EA Omits Impacts from the Most Significant Undertaking Required by the Rule: Construction of Gerdau's Meltshop/Baghouse.</u>**

The District acknowledges that Gerdau's Rancho Cucamonga facility will not be able to meet many of the requirements of the rule without completion of its meltshop/baghouse project. Yet the EA omits all discussion of the impacts of constructing and operating this project. Page 2-7 of the EA explains that the environmental analysis for the rule includes only impacts from installation of a negative air pressure system and increased housekeeping. 1-5

The Draft EA dismisses impacts from the meltshop/baghouse project because the project was initially proposed and permits to construct issued before Rule 1420.2 was proposed. Even so, Rule 1420.2 will fundamentally change the regulatory landscape for the company. Completion of the project will essentially be mandated by the rule, as the only other means of compliance would be to cease operations. CEQA precedents confirm that the change in legal status of even an ongoing activity can cause environmental impacts that must be reviewed in an EIR. See, e.g., *Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal. App. 4th 1170. Adoption or amendment of a regulation in recognition of the status quo can nonetheless require CEQA review because a change in enforceability can result in changes in the physical environment. The environmental impacts of a change in regulatory status are even more closely tied to the proposed rule here, where the meltshop/baghouse project has not yet been constructed, and progress on the project has been suspended since the District announced its intention to adopt proposed Rule 1420.2. 1-6

Omission of the impacts of the meltshop/baghouse project also creates deficiencies in detailed analyses in the Draft EA. For example, the discussion of construction impacts (starting on pg.2-15 of the Draft EA) implies that construction of air pollution control devices for the compliance plan were assessed in the EA, but Gerdau's construction was omitted. Also, the EA states that construction impacts will not overlap between facilities: "Given the short duration of construction and the amount of time for facilities to comply with PR 1420.2, staff assumed that the construction phases at these different facilities would not overlap (pg. 2-17)." However, this assumption does not take into account the lengthy construction schedule for the Gerdau's meltshop/baghouse project. In Appendix B of the Draft EA, the construction phase of the air pollution control devices is listed as only 21 days. Thus, it is quite possible that, on a peak-day, construction of the meltshop/baghouse project will overlap with construction by other facilities subject to proposed Rule 1420.2. The schedule that Gerdau has previously submitted to the District shows that construction of the meltshop/baghouse project will take approximately two years, not a few days. 1-7

Similarly, the EA analyzes only 54 days of construction of a total enclosure, while Gerdau's construction will require additional months following completion of the new baghouse. The EA also severely underestimates the size of the assumed enclosure, analyzing only 31,250 square feet of enclosure compared to the 285,000 feet proposed for Gerdau's project.

If the District continues to exclude Gerdau's meltshop/baghouse project from the proposed Rule 1420.2 impact analysis, at a minimum the project must be included in the cumulative impacts analysis for both air quality and greenhouse gas impacts. Gerdau's meltshop/baghouse project will overlap with implementation of other construction required to comply with Rule 1420.2. As 1-8 noted above, the cumulative impacts would be significant for air quality and require preparation of Environmental Impact Report (EIR).

4. The EA Must Evaluate Environmental Impacts Resulting from Economic Impacts.

CEQA Guidelines Section 15131 provides:

> Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

As explained above, the pre-June 12, 2015 versions of the rule contained provisions that would have been technologically or economically infeasible, and would have resulted in the closure of the Rancho Cucamonga facility. For example, it likely would be technologically infeasible to achieve the point source control efficiency required by Subsection (f) for small point sources with low concentrations of lead in the exhaust. Even if achievable, this requirement would have resulted in no measurable benefit in the community, at great expense. Similarly, pre-June versions of the rule would have required total enclosure of handling and storage of lead-containing materials, including slag. For Gerdau, this would have required construction of total enclosure for our lead handling and slag storage area, which currently spans approximately 12.4 acres. The cost of construction of such an enclosure would have been many millions of dollars, and it could not have been completed within the time frame specified. Testing has shown that our slag has a lead content within the range of naturally occurring soils in California, so this expense would not have produced a meaningful reduction in lead concentrations in the community. 1-9

The June 12, 2015 version of the rule likewise contained a number of provisions that were technologically, economically or legally infeasible. If adopted, these provisions would result in the closure of the Rancho Cucamonga plant. This consequence will be discussed in greater detail in our comments on the proposed rule and the Draft Socio-economic Report.

CEQA does not require the EA to discuss the direct economic impact to the company or the community from the closure. But facility closure would cause substantial environmental effects in the immediate vicinity, in the region, and beyond. These impacts must be discussed in the EA if any of the above-listed provisions is contained in the final rule as adopted.

The Rancho Cucamonga facility is a major employer and contributor to the local economy, and its closure could set in motion localized environmental impacts considered blight or urban decay. Vacancy of a major business or structure can trigger a downward spiral of other business closures and long-term vacancies. In CEQA, "urban decay" is generally defined as visible symptoms of physical deterioration that invite vandalism, loitering, and graffiti. Urban decay may include boarded doors and windows, deferred maintenance of structures, unauthorized use of buildings and parking lots, littering, dead or overgrown vegetation, and third party dumping of refuse. Thus, a deteriorating economic condition may cause deterioration of the physical conditions. These changes in the physical environment would be adverse environmental impacts that must be evaluated under CEQA.

The Draft EA would also need to evaluate the alternative scenario of removal of the facility to avoid blight. There would be substantial environmental impacts associated with dismantling the facility. These include engine emissions from demolition equipment and off-road and on-road motor vehicles, including vehicles removing waste from the site. It also would include fugitive emissions associated with demolition and vehicular travel on the site.

Many of our employees are highly skilled and highly compensated workers. But the Rancho Cucamonga facility is the last remaining steel mill in California; therefore, their skills may not match the requirements of other employers in the immediate vicinity. Closure of the plant may initiate an extended period during which the employees drive substantial additional miles looking for new employment. An increase in vehicle miles traveled translates into additional traffic and air quality impacts that would need to be quantified and evaluated in the Draft EA.

On the regional, statewide and global levels, closure of the Rancho Cucamonga facility would affect major market chains, including waste management, metals recycling, and the production of seismic rebar, with consequential environmental impacts. The Rancho Cucamonga facility receives scrap metal from sources throughout Southern California. (Approximately 90% comes from sources within 75 miles of the plant, 6% from sources between 75-125 miles, and the remainder from sources more than 125 miles, including small amounts from Arizona and Nevada.) The plant recycles the scrap metal to produce seismic rebar needed for construction in California. Loss of this facility would cause dislocation in construction, demolition, and metals recycling, manufacturing and supply. 1-9 cont

These dislocations would directly cause environmental impacts. Scrap metal would have to be hauled longer distances. Because there is no other steel mini-mill in California, the scrap metal would have to be hauled out of state or out of the country. Given our knowledge of the metals industry, we believe the most likely outcome is that the scrap metal would be hauled by truck or train to the Ports of Los Angeles or Long Beach, transshipped onto marine vessels, and transported to Asia. There, it would be recycled into new steel products. This may or may not include seismic rebar, depending upon the market interests of the scrap purchaser or recycler. In any event, California's need for seismic rebar would need to be met by manufacturers outside California. Thus, the CEQA analysis would need to include the substantial traffic, transportation, air emissions and other impacts associated with transporting the scrap out of California, and transporting seismic rebar into the state. In addition, given California's groundbreaking regulation of greenhouse gas emissions, it is most likely that recycling the scrap metal and manufacturing the seismic rebar outside the state will produce much greater greenhouse gas emissions than baseline emissions for these same activities.

Our air quality expert, Joseph Hower of Ramboll Environ US Corporation, prepared a simple air quality analysis assuming that the work and the Rancho Cucamonga facility would shift to an existing facility in Arizona. Even under this scenario, air emissions impacts of closing the Rancho Cucamonga facility would be significant, as shown in Table 1 below:

Table 1. Emissions Increase due to Transportation of Scrap Metal and Final Product in the event of Shutdown of the Gerdau TAMCO Facility

Parameter	Delivery Trucks to and from Nucor Plant in Arizona	Delivery Trucks to and from TAMCO	Increase from TAMCO Steel Mill Shutdown
Vehicle Miles Travelled (miles/day)[1]			
Total VMT	141,823	44,738	97,085
Criteria Air Pollutant Emissions (lb/day)[2]			
NO_x	1,934	610	1,324
CO	382.3	120.6	261.7
PM_{10}	60.6	19.1	41.5
$PM_{2.5}$	39.1	12.3	26.7
SO_x	5.2	1.6	3.5
VOC	75.2	23.7	51.5
Greenhouse Gas Emissions (MT/yr)[3]			
CO_2	85,215	26,881	58,334
CH_4	0.6	0.2	0.4
N_2O	2.9	0.9	2.0
Total GHG[4]	86,127	27,169	58,958

Notes:
[1] Project VMT were estimated by multiplying the 2013 VMT by the production rate scaling factor.
[2] Criteria pollutant emissions were estimated using the VMT in SCAB.
[3] Greenhouse gas emissions were estimated using the VMT in California.
[4] Calculated using the following global warming potentials from the Intergovernmental Panel on Climate Change Second Assessment Report. Available at http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14, Accessed August, 2014.

As noted above, the more likely outcome would be a shift in the scrap and manufacturing to Asia, resulting in air emissions far greater than those in Table 1.

Given the magnitude of all these impacts, a full environmental impact report would likely be required.

1-9 cont

5. The Draft Relies Excessively on Unsubstantiated Assumptions.

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Many conclusions in the Draft EA are based on nothing more than staff impressions with no supporting information. There are several variations on unsupported conclusions: 1-10

- For some impact topics, where the rule allows two or more compliance options, the Draft EA analysis seems to assume only one of the options will be followed, and ignores the impacts associated with the other option(s). For example Subsection (h)(5) of the rule requires that all materials capable of generating any amount of fugitive lead dust, including slag, be stored in sealed, leak-proof containers, located within a total enclosure, or stabilized using dust suppressants. The Draft EA does not appear to evaluate any impacts (e.g., construction air emissions, conflict with land use zoning and other restrictions, stormwater runoff from additional impermeable surfaces) associated with fully enclosed storage of slag. If the analysis in the Draft EA is based on the assumption that all regulated companies will use the dust suppressant compliance option, this assumption should be clearly stated. Alternatively, the Draft EA should evaluate the impacts associated with construction and operation of full enclosure of slag.

- For some impact topics, where there is a potential exemption from the rule, the analysis appears to assume that the exemption will apply to all companies and their activities that would otherwise be regulated, and the Draft EA does not discuss the impacts of any compliance actions whatsoever. For example, the Draft EA appears to assume that all slag handling will be exempt from the sealed container requirement in Subsection ___, because it does not consider construction or operational impacts associated with totally enclosed slag conveyance systems handling hot slag. 1-11

- Some assumptions are articulated but the basis for the assumptions are not documented, or the assumptions are not supported with references to relevant data or technical references demonstrating the reasonableness of the assumptions. The Draft EA makes broad and unsubstantiated assumptions regarding zoning, land use, and noise ordinances, among others. In many cases, it would be fairly simple to obtain accurate information or data rather than making broad, unsupported assumptions, yet the Draft EA makes no effort to do so. For example, the discussion of Questions XII. d) and XVII. c) in the Checklist state that it is not known whether the regulated facilities are in an airport land use plan or within two miles of a public airport. The District expects the rule to affect thirteen known facilities at thirteen known locations. (DEA, p. 1.6). Given the known locations of the facilities and of the region's airports, it would be a straightforward task to locate this information. Similarly, it would be a simple matter to determine how the requirements of the rule would be treated under local zoning, land use and other ordinances regulating landscaping, aesthetics, building heights, noise and other parameters in the relevant cities and counties. The Draft EA fails to do so. 1-12

Given the very small number of sources regulated by the rule, the Draft EA's failure to provide meaningful detail is contrary to CEQA's requirements for public disclosure and opportunity to comment.

PART II. DETAILED COMMENTS

Page	Comment
1-2	**Introduction**: The text states that the rule will reduce "the further accumulation of lead dust in and around these" metal melting facilities. The Draft EA does not provide any evidence that accumulation has occurred or is occurring in and around these facilities. Therefore, the Draft EA should not take credit for such reductions in evaluating the effects of the rule. 1-13
1-2	**Project Location:** The text following this heading describes the entire South Coast Air Basin and portions of the Salton Sea and Mojave Desert Air Basins. The inference is that this entire area is the Project Location. This is misleading in that the rule affects specifically 13 facilities that have been identified by the SCAQMD. As summarized in EPA's Integrated Science Assessment (ISA; see 78 Fed.Reg. 38318, June 26, 2013), "Since the phase-out of Pb in on-road gasoline, Pb is widely recognized as a source-oriented air pollutant. Variability in air Pb concentrations is highest in areas including a Pb source, with high concentrations downwind of the sources and low concentration at areas far from sources." (80 Fed.Reg. 278, 283, January 5, 2015.) This means that lead emission reductions from the rule will have an effect near the source but there will be no measurable change in the SCAB as whole. 1-14 Presenting the project area as the entire SCAB and portions of two more basins causes deficiencies in the EA. The Draft EA fails to present relevant information about the existing environment in the vicinity of the 13 regulated facilities. The SCAQMD's network of ten non-source oriented monitors shows ambient concentrations in 2007 to 2013 "well below the 2008 NAAQS for lead of 0.15 $\mu g/m^3$," ranging from 0.01 to 0.03 $\mu g/m^3$. (Preliminary Draft Staff Report dated April 2015, p. 1-7.) Information is presented in the April 2015 Staff Report regarding fence-line monitoring for the Gerdau/Tamco facility, but even for this facility there is no information presented in the Staff Report or the Draft EA about ambient lead levels in the surrounding community. Information is presented in the Draft Staff Report about Trojan Battery, but it the text does not disclose whether the measurements are taken at the fenceline or in the community. Without relevant information regarding the environmental setting, it is impossible to accurately assess the effects of the rule. 1-15

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Page	Comment
1-4	**Health Effects of Lead:** The Draft EA references and quotes a few selective phrases from U.S. EPA documents to create the misleading impression that there is substantial doubt and uncertainty regarding a health protective lead exposure level to ensure young children do not experience nervous system effects including cognitive effects. Selective quotes suggest that the federal NAAQS of 0.15 μg/m^3 is not health protective for young children. In fact, EPA's January 5, 2015 Federal Register Notice clearly explains that the agency proposes to retain the 0.15 μg/m^3 primary NAAQS because it will protect the public welfare from any known or anticipated adverse effects associated with the presence of lead in the ambient air, including an adequate margin of safety to address uncertainties and a reasonable degree of protection against hazards that research has not yet even identified. (80 Fed.Reg. 278 *et seq.*) EPA also stated that when a standard of a particular level is just met at a monitor sited to record the highest source-oriented concentration in an area, the large majority of children in the surrounding area would likely experience exposures to concentrations well below that level. (80 Fed.Reg at 287.) The misleading presentation of EPA's research and conclusions taints the Draft EA's discussion of the environmental and regulatory setting, as well as the policy decisions reflected in the rule. The EPA's work should be presented more fully and accurately in the EA.
1-6	**Table 1-1:** The SIC codes presented in this table do not correspond to the NAIC codes used on pages 1-8 to 1-16, making it difficult for the reader to follow the descriptions of the regulated companies and the Project Description. References should be standardized. Both Table 1-1 and the discussion on pages 1-8 to 1-16 would be improved by identifying the facilities by name. Naming the facilities would also aid the reader in reviewing assumptions regarding construction and other actions required for compliance, to confirm the accuracy of emissions estimates and other impact analyses.
1-10	**Process Emission Points and Controls:** Gerdau strongly disagrees that transfer, handling and storage of slag can be a source of fugitive lead dust emissions. Gerdau has submitted test data to the District showing that the lead content of its slag is within the range of lead concentration present in native soils in California. The EA does not present any data supporting its statement that slag is a source of lead emissions. As such, the EA misrepresents the environmental setting for the project. This in turn results in the EA attributing emissions benefits to implementation of the rule.

1-16

1-17

1-18

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Page	Comment	
1-17	**Applicability:** The EA states that data from SCAQMD monitors at two metal mantling facilities have shown the potential for this source category to exceed the NAAQS lead limit of 0.15 $\mu g/m^3$ averaged over a rolling 3 month period. This statement does not accurately reflect the data. At least with respect to data gathered at TAMCO/Gerdau, monitoring occurred on the grounds of the facilities, near the fenceline. Monitoring did not occur in the ambient air as defined for purposes of compliance with the federal NAAQS. By overstating data regarding the lead concentrations in the existing setting, the EA in turn attributes environmental benefits to implementation of the proposed rule. In this regard, it also should be noted that the definition of ambient air in the proposed rule does not conform to federal definitions. This should be fully explained in the EA so that the public is not misled by quotes from federal documents taken out of context.	1-19
2-6	**Discussion and Evaluation of Environmental Impacts:** Paragraph 3 states that the CEQA analysis assumes a worst case scenario where facilities are expected to do further actions to meet the core requirements of the proposed rule, or additional controls as part of a compliance plan. However, as noted in Part I of these comments, the analysis omits all impacts associated with Gerdau's construction and operation of its meltshop/baghouse project. In addition, the analysis omits impacts associated with the potential closure of the Gerdau facility if the rule as analyzed in the EA were to be promulgated. As such, the EA fails to evaluate all impacts associated with the proposed rule.	1-20
2-7	**Discussion and Evaluation of Environmental Impacts:** The text at the top of the page suggests that most facilities are expected to meet point source requirements in the rule. Table 2-3 on page 2-16. In fact, the EA assumes that ***no*** construction of point source controls will be required, and so attributes no impacts to this portion of the rule. The EA should be more explicit in stating the assumptions underlying its analysis and conclusions. The EA also should explain the basis for assuming that no additional point source controls will be required. For example, the EA might explain that point sources not already equipped with air pollution control devices are expected to be exempt through other provisions of the rule. In addition, the proposed rule contains many requirements that are not addressed in the assumptions presented on pages 2-6 to 2-7. For example, the explanation of assumptions does not address the requirements for total enclosure of materials storage areas, including slag storage. If the EA is based on the assumption that no construction or operation is required because all regulated facilities will use dust suppressants on slag piles and handling of hot slag will be exempt, this must be stated clearly in the EA.	1-21 1-22

Page	Comment	
2-8/9	**Table 2-1:** The table does not list Transportation as an *Environmental Topic to be Analyzed* for Total Enclosures or Compliance Plan. Because Total Enclosures will need to be constructed for two facilities and the Compliance Plan requirement of the PR 1420.2 is expected to result in construction of new air pollution control devices, construction activities will involve additional vehicle trips to the applicable site. This should be captured in the transportation analysis and listed in the *Environmental Topic to be Analyzed* column of Table 2-1.	1-23
2-10 to 2-11	**Aesthetics:** The Draft EA dismisses the topic of aesthetic impacts with the observation that the 13 regulated facilities are located in urbanized industrial or commercial areas. This is not sufficient under CEQA. Aesthetic issues can be of particular interest to neighbors in highly urbanized settings. In addition, requirements for total enclosure of slag handling and storage could result in the construction of new conveyor systems and tall new walls that would be visible from a distance. There are only 13 regulated facilities. The EA should more specifically describe the setting of the 13 facilities, and provide a meaningful, supported explanation for the conclusion that there will be no significant aesthetic impacts.	1-24
2-13 to 2-23	**Air Quality:** See Part 1, General Comments. The air quality analysis fails to consider the construction and operational emissions associated with the Gerdau meltshop/baghouse project.	1-25
2-14	**III. a):** The Draft EA concludes that there would be no adverse impact related to inconsistency with an air quality plan because the proposed rule is consistent with the plan. This reasoning improperly equates the Project and Project Objectives with the Project impacts. The Draft EA must discuss whether the emissions associated with the construction and operational actions needed to achieve compliance will conflict with an approved air quality plan.	1-26
2-17	The text at the top of the page presents very limited actions required to comply with the requirements of the rule. This picture is not accurate with respect to construction of total enclosure of slag handling and storage. If the EA is premised on the assumption that no facility will need to construct enclosed conveyors and storage enclosures, this assumption should be disclosed and explained. In the same vein, there is no support for the assumption in footnote 4 that no grading would be required, particularly if Gerdau is required to construct enclosed slag conveyors and total enclosures for slag storage. The last paragraph states that staff assumed construction periods for the various facilities will not overlap. See Part 1, General Comments, with respect to the long construction schedule required to complete the Gerdau meltshop/baghouse.	1-27
2-19	**Operational Impacts:** The EA assumes that a round trip distance of 200 miles to transport hazardous waste. The EA does not contain sufficient information regarding the location of the regulated facilities or the waste disposal sites to substantiate this assumption.	1-28

Page	Comment	
2-21	**III. d) Toxic Air Contaminants:** See comments above regarding construction schedule assumptions. Twenty-one days is insufficient time to construct the Gerdau meltshop/baghouse. It also is insufficient time to construct enclosed conveyors for slag handling, total enclosures for slag storage, site paving the large Gerdau site, and other requirements of the rule. If the EA is premised on the assumption that compliance with these standards will not be required due to use of other compliance options or exemptions, the assumptions should be disclosed and explained.	1-29
2-22	**Greenhouse Gas Impacts:** See comments above. In the same manner that the EA underestimates construction and operational emission of criteria pollutants, so too it underestimates emissions of greenhouse gas emissions. In addition, as described in Part I, General Comments, closure of the Rancho Cucamonga facility would cause major disruptions and shifts in scrap metal hauling and recycling and the manufacture of seismic rebar for the California market. These shifts would result in a substantial increase in greenhouse gas emissions that must be evaluated in the EA, if the proposed rule retains any provisions that would result in the closure of the Rancho Cucamonga facility.	1-30
2-23 to 2-25	**Biological Impacts:** The EA dismisses impacts to biological resources because the regulated facilities are within urban areas. This is not sufficient analysis under CEQA. The June 2015 version of the rule evaluated in the EA would require elimination of nearly all landscaped areas at the Gerdau plant. The same may be true of other regulated facilities. Within an urban environment, even non-native vegetation can be important in connecting habitats of sensitive species. Moreover, CEQA requires analysis of impacts to migratory birds regardless whether a specific species is listed as threatened or endangered.	1-31
2-24	**Biological Impacts:** The EA suggests that the proposed rule would have a beneficial impact "more closely in line with protecting biological resources" because it is designed to reduce lead emissions. Implicit in this claimed environmental benefit is the assumption that current levels of lead in the environment are harming biological resources. The EA must provide support for this assumption or delete the unsubstantiated claim of environmental benefit to biological resources.	1-32
2-26	**Cultural Resources Discussion, V. a):** The EA states that none of the facilities include any existing structures that would be considered historically significant, that have contributed to California history, or that pose high artistic values. The EA provides no substantiation for this conclusion in the form of cultural resources surveys or even site visits by trained historians or architects.	1-33
2-27 to 2-31	**Energy:** The Draft EA fails to quantify and evaluate the following energy (gas, electricity, gasoline and diesel) requirements of compliance with the proposed rule: construction and operation of enclosed slag conveyors; construction of enclosed slag storage; construction and operation of the Gerdau meltshop/baghouse, including three new 1,500 hp exhaust fans; 1-in-3 day air monitoring.	1-34

Page	Comment	
2-33	**Geology and Soils, VII. b):** The EA fails to evaluate any impacts on soil erosion or loss of topsoil associated with removing landscaping, grading and paving the site. If it is assumed that no facility will be required to take these actions due to other compliance options or exemptions, the EA should clearly state the assumptions and the underlying support for the assumptions.	1-35
2-41	**Land Use and Planning, X. b):** The Draft EA summarily dismisses this topic because the regulated facilities are located in urbanized, industrial or commercial areas. This is inadequate under CEQA. Rule requirements implicating the zoning, planning and other land use controls of local governments include the construction of tall walls or buildings, installation of enclosed conveyors, removal of landscaping, to illustrate just a few. The EA must be revised to include a meaningful discussion of potential land use impacts.	1-36
2-43	**Noise, XII. a), b), and c):** The Draft EA omits discussion of the potential noise impacts associated with the construction and operation of enclosed slag conveyors. If it is assumed that no facility will be required to construct and operate enclosed slag conveyors due to other compliance options or exemptions, the EA should clearly state the assumptions and the underlying support for the assumptions.	1-37
2-43	**Noise, XII. d):** The Draft EA states that it is not known whether existing facilities are located within an airport land use plan or within 2 miles of a public airport. Only 13 facilities are regulated by the rule. This information is readily available and should be disclosed in the Draft EA.	1-38
2-47 to 2-49	**Solid and Hazardous Waste:** The Draft EA states that no demolition is expected as a result of the proposed rule. See comments above regarding the EA's failure to evaluate Gerdau's substantial meltshop/baghouse construction, which will include generation of demolition waste. In addition, cities and counties are required by state law to reduce the amount of waste, including construction waste, going to landfills. In the event that onerous or infeasible requirements are restored or added to the rule, causing closure of the Rancho Cucamonga facility, then either cities and counties will struggle to meet their diversion requirements under state law, or the scrap metal currently processed at the Rancho Cucamonga facility will need to be transported to out of state or out of country facilities, causing environmental impacts described elsewhere in these comments.	1-39
2-49 to 2-51	**Transportation and Traffic:** See Part I, General Comments. In the event that onerous or infeasible requirements are restored or added to the rule, causing closure of the Rancho Cucamonga facility, then the scrap metal currently processed at the Rancho Cucamonga facility will need to be transported to out of state or out of country facilities, causing environmental impacts described elsewhere in these comments.	1-40

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PART III. LIST OF ATTACHMENTS

Federal Register

78 Fed. Reg. 38318, June 26, 2013.

80 Fed. Reg. 278, January 5, 2015 (National Ambient Air Quality Standards for Lead, Proposed Rule).

FEDERAL REGISTER

Vol. 80 Monday,

No. 2 January 5, 2015

Part II

Environmental Protection Agency

40 CFR Part 50

National Ambient Air Quality Standards for Lead; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 50

[EPA–HQ–OAR–2010–0108; FRL–9915–57–OAR]

RIN 2060–AQ44

National Ambient Air Quality Standards for Lead

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: Based on the Environmental Protection Agency's (EPA's) review of the air quality criteria and the national ambient air quality standards (NAAQS) for lead (Pb), the EPA is proposing to retain the current standards, without revision.

DATES: Comments must be received on or before April 6, 2015.

Public Hearings: If, by January 26, 2015, the EPA receives a request from a member of the public to speak at a public hearing concerning the proposed decision, we will hold a public hearing, with information about the hearing provided in a subsequent notice in the **Federal Register**.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OAR–2010–0108 by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov:* Follow the on-line instructions for submitting comments.
- *Email: a-and-r-Docket@epa.gov.* Include docket ID No. EPA–HQ–OAR–2010–0108 in the subject line of the message.
- *Fax:* 202–566–9744.
- *Mail:* Docket No. EPA–HQ–OAR–2010–0108, Environmental Protection Agency, Mail Code 28221T, 1200 Pennsylvania Ave. NW., Washington, DC 20460.
- *Hand Delivery:* Docket No. EPA–HQ–OAR–2010–0108, Environmental Protection Agency, EPA WJC West Building, Room 3334, 1301 Constitution Ave. NW., Washington, DC. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR–2010–0108. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *www.regulations.gov* or email. The *www.regulations.gov* Web site is an "anonymous access" system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *www.regulations.gov,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

Public Hearing: To request a public hearing or information pertaining to a public hearing on this document, contact Ms. Eloise Shepherd, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards (C504–02), U.S. Environmental Protection Agency, Research Triangle Park, NC 27711; telephone number (919) 541–5507; fax number (919) 541–0804; email address: *shepherd.eloise@epa.gov.* See the **SUPPLEMENTARY INFORMATION** for further information about a possible public hearing.

Docket: All documents in the docket are listed on the *www.regulations.gov* Web site. This includes documents in the rulemaking docket (Docket ID No. EPA–HQ–OAR–2010–0108) and a separate docket, established for the Integrated Science Assessment for this review (Docket ID No. EPA–HQ–ORD–2011–0051) that has been incorporated by reference into the rulemaking docket. All documents in these dockets are listed on the *www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and may be viewed, with prior arrangement, at the EPA Docket Center. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the Air and Radiation Docket Information Center, EPA/DC, WJC West Building, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744 and the telephone number for the Air and Radiation Docket Information Center is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: Dr. Deirdre L. Murphy, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Mail Code C504–06, Research Triangle Park, NC 27711; telephone: (919) 541–0729; fax: (919) 541–0237; email: *murphy.deirdre@epa.gov.* To request a public hearing or information pertaining to a public hearing on this document, contact Ms. Eloise Shepherd, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards (C504–02), U.S. Environmental Protection Agency, Research Triangle Park, NC 27711; telephone number (919) 541–5507; fax number (919) 541–0804; email address: *shepherd.eloise@epa.gov.*

SUPPLEMENTARY INFORMATION:

General Information

Preparing Comments for the EPA

1. *Submitting CBI.* Do not submit this information to the EPA through *www.regulations.gov* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD–ROM that you mail to the EPA, mark the outside of the disk or CD–ROM as CBI and then identify electronically within the disk or CD–ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

2. *Tips for Preparing Your Comments.* When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- Follow directions—the agency may ask you to respond to specific questions or organize comments by referencing a

Code of Federel Regulations (CFR) part or section number.

• Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.

• Describe any assumptions and provide any technical information and/or data that you used.

• Provide specific examples to illustrate your concerns, and suggest alternatives.

• Explain your views as clearly as possible, avoiding the use of profanity or personal threats.

• Make sure to submit your comments by the comment period deadline identified.

Availability of Information Related to This Action

A number of the documents that are relevant to this action are available through the EPA's Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network (TTN) Web site at *http://www.epa.gov/ttn/naaqs/standards/pb/s_pb_index.html.* These documents include the *Plan for Review of the National Ambient Air Quality Standards for Lead* (USEPA, 2011a), available at *http://www.epa.gov/ttn/naaqs/standards/pb/s_pb_2010_pd.html,* the *Integrated Science Assessment for Lead* (USEPA, 2013a), available at *http://www.epa.gov/ttn/naaqs/standards/pb/s_pb_2010_isa.html,* the *Review of the National Ambient Air Quality Standards for Lead: Risk and Exposure Assessment Planning Document* (USEPA, 2011b), available at *http://www.epa.gov/ttn/naaqs/standards/pb/s_pb_2010_pd.html,* and the *Policy Assessment for the Review of the Lead National Ambient Air Quality Standards* (USEPA, 2014), available at *http://www.epa.gov/ttn/naaqs/standards/pb/s_pb_2010_pa.html.* These and other related documents are also available for inspection and copying in the EPA docket identified above.

Information About a Possible Public Hearing

To request a public hearing or information pertaining to a public hearing on this document, contact Ms. Eloise Shepherd, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards (C504–02), U.S. Environmental Protection Agency, Research Triangle Park, NC 27711; telephone number (919) 541–5507; fax number (919) 541–0804; email address: *shepherd.eloise@epa.gov.*

Table of Contents

The following topics are discussed in this preamble:

I. Background

A. Legislative Requirements

Two sections of the Clean Air Act (CAA or the Act) govern the establishment and revision of the NAAQS. Section 108 (42 U.S.C. 7408) directs the Administrator to identify and list certain air pollutants and then to issue air quality criteria for those pollutants. The Administrator is to list those air pollutants that in her "judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare;" "the presence of which in the ambient air results from numerous or diverse mobile or stationary sources;" and "for which . . . [the Administrator] plans to issue air quality criteria . . ." Air quality criteria are intended to "accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of [a] pollutant in the ambient air . . ." 42 U.S.C. 7408(b). Section 109 (42 U.S.C. 7409) directs the Administrator to propose and promulgate "primary" and "secondary" NAAQS for pollutants for which air quality criteria are issued. Section 109(b)(1) defines a primary standard as one "the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health."[1] A secondary standard, as defined in section 109(b)(2), must "specify a level of air quality the attainment and maintenance of which, in the judgment of the Administrator, based on such criteria, is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of [the] pollutant in the ambient air."[2]

The requirement that primary standards provide an adequate margin of safety was intended to address uncertainties associated with

[1] The legislative history of section 109 indicates that a primary standard is to be set at "the maximum permissible ambient air level . . . which will protect the health of any [sensitive] group of the population," and that for this purpose "reference should be made to a representative sample of persons comprising the sensitive group rather than to a single person in such a group." See S. Rep. No. 91–1196, 91st Cong., 2d Sess. 10 (1970).

[2] Welfare effects as defined in section 302(h) (42 U.S.C. 7602(h)) include, but are not limited to, "effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being."

inconclusive scientific and technical information available at the time of standard setting. It was also intended to provide a reasonable degree of protection against hazards that research has not yet identified. *See Lead Industries Association* v. *EPA,* 647 F.2d 1130, 1154 (D.C. Cir 1980), *cert. denied,* 449 U.S. 1042 (1980); *American Petroleum Institute* v. *Costle,* 665 F.2d 1176, 1186 (D.C. Cir. 1981), *cert. denied,* 455 U.S. 1034 (1982); *American Farm Bureau Federation* v. *EPA,* 559 F.3d 512, 533 (D.C. Cir. 2009); *Association of Battery Recyclers* v. *EPA,* 604 F.3d 613, 617–18 (D.C. Cir. 2010). Both kinds of uncertainties are components of the risk associated with pollution at levels below those at which human health effects can be said to occur with reasonable scientific certainty. Thus, in selecting primary standards that provide an adequate margin of safety, the Administrator is seeking not only to prevent pollution levels that have been demonstrated to be harmful but also to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. The CAA does not require the Administrator to establish a primary NAAQS at a zero-risk level or at background concentration levels, see Lead Industries v. EPA, 647 F.2d at 1156 n.51, but rather at a level that reduces risk sufficiently so as to protect public health with an adequate margin of safety.

In addressing the requirement for an adequate margin of safety, the EPA considers such factors as the nature and severity of the health effects involved, the size of sensitive population(s) at risk,[3] and the kind and degree of the uncertainties that must be addressed. Tbe selection of any particular approach to providing an adequate margin of safety is a policy choice left specifically to the Administrator's judgment. See *Lead Industries Association* v. *EPA,* 647 F.2d at 1161–62.

In setting primary and secondary standards that are "requisite" to protect public health and welfare, respectively, as provided in section 109(b), the EPA's task is to establish standards that are neither more nor less stringent than necessary for these purposes. In so doing, the EPA may not consider the costs of implementing the standards. See generally, *Whitman* v. *American Trucking Associations,* 531 U.S. 457, 465–472, 475–76 (2001). Likewise, "[a]ttainability and technological feasibility are not relevant considerations in the promulgation of national ambient air quality standards." *American Petroleum Institute* v. *Costle,* 665 F.2d at 1185.

Section 109(d)(1) requires that "not later than December 31, 1980, and at 5-year intervals thereafter, the Administrator shall complete a thorough review of the criteria published under section 108 and the national ambient air quality standards . . . and shall make such revisions in such criteria and standards and promulgate such new standards as may be appropriate. . . ." Section 109(d)(2) requires that an independent scientific review committee "shall complete a review of the criteria . . . and the national primary and secondary ambient air quality standards . . . and shall recommend to the Administrator any new . . . standards and revisions of existing criteria and standards as may be appropriate. . . ." Since the early 1980s, this independent review function has been performed by the Clean Air Scientific Advisory Committee (CASAC).[4]

B. Related Lead Control Programs

States are primarily responsible for ensuring attainment and maintenance of the NAAQS. Under section 110 of the Act (42 U.S.C. 7410) and related provisions, states are to submit, for EPA approval, state implementation plans (SIPs) that provide for the attainment and maintenance of such standards through control programs directed to sources of the pollutants involved. The states, in conjunction with the EPA, also administer the Prevention of Significant Deterioration program (42 U.S.C. 7470–7479) for these pollutants.

The NAAQS is only one component of the EPA's programs to address Pb in the environment. Federal programs additionally provide for nationwide reductions in air emissions of these and other air pollutants through the Federal Motor Vehicle Control program under Title II of the Act (42 U.S.C. 7521–7574), whicb involves controls for automobile, truck, bus, motorcycle, nonroad engine, and aircraft emissions; the new source performance standards under section 111 of the Act (42 U.S.C. 7411); emissions standards for solid waste incineration units and the national emission standards for hazardous air pollutants (NESHAP) under sections 129 (42 U.S.C. 7429) and 112 (42 U.S.C. 7412) of the Act, respectively.

Tbe EPA has taken a number of actions associated with these air pollution control programs since the last review of the Pb NAAQS, including completion of several regulations which will result in reduced Pb emissions from stationary sources regulated under the CAA sections 112 and 129. For example, in January 2012, the EPA updated the NESHAP for the secondary lead smelting source category (77 FR 555, January 5, 2012). These amendments to the original maximum achievable control technology standards apply to facilities nationwide that use furnaces to recover Pb from Pb-bearing scrap, mainly from automobile batteries (15 existing facilities, one under construction). By the effective date in 2014, this action is estimated to result in a Pb emissions reduction of 13.6 tons per year (tpy) across the category (a 68% reduction). Somewhat lesser Pb emissions reductions are also expected from regulations completed in 2013 for commercial and industrial solid waste incineration units (78 FR 9112, February 7, 2013), as well as several other regulations since 2007 (72 FR 73179, December 26, 2007; 72 FR 74088, December 28, 2007; 73 FR 225, November 20, 2008; 78 FR 10006, February 12, 2013; 76 FR 15372, March 21, 2011; 78 FR 7138, January 31, 2013; 74 FR 51368, October 6, 2009; Policy Assessment, Appendix 2A).

The presentation below briefly summarizes additional ongoing activities that, although not directly pertinent to the review of the NAAQS, are associated with controlling environmental Pb levels and human Pb exposures more broadly. Among those identified are the EPA programs intended to encourage exposure reduction programs in other countries.

Reducing Pb exposures has long been recognized as a federal priority as environmental and public health agencies continue to grapple with soil and dust Pb levels from the historical use of Pb in paint and gasoline and from other sources (Alliance to End Childhood Lead Poisoning, 1991; 62 FR 19885, April 23, 1997; 66 FR 52013, October 11, 2001; 68 FR 19931, April 23, 2003). A broad range of federal programs beyond those that focus on air pollution control provide for nationwide reductions in environmental releases and human exposures. For example, pursuant to section 1412 of the Safe Drinking Water Act (SDWA), the EPA regulates Pb in public drinking water systems through corrosion control

[3] As used here and similarly throughout this notice, the term population (or group) refers to persons having a quality or characteristic in common, such as a specific pre-existing illness or a specific age or life stage. As discussed more fully in section II.B.4 below, the identification of sensitive groups (called at-risk groups or at-risk populations) involves consideration of susceptibility and vulnerability.

[4] Lists of CASAC members and of members of the CASAC Lead Review Panel are available at: *http://yosemite.epa.gov/sab/sabproduct.nsf/WebCASAC/CommitteesandMembership?OpenDocument.*

and other utility actions which work together to minimize Ph levels at the tap (40 CFR 141.80–141.91). Under section 1417 of the SDWA, pipes, fittings and fixtures for potable water applications may not be used or introduced into commerce unless they are considered "lead free" as defined by that Act (40 CFR 141.43).[5] Additionally, federal Pb abatement programs provide for the reduction in human exposures and environmental releases from in-place materials containing Pb (*e.g.*, Pb-based paint, urban soil and dust, and contaminated waste sites). Federal regulations on disposal of Pb-based paint waste help facilitate the removal of Pb-based paint from residences (68 FR 36487, June 18, 2003).

Federal programs to reduce exposure to Pb in paint, dust, and soil are specified under the comprehensive federal regulatory framework developed under the Residential Lead-Based Paint Hazard Reduction Act (Title X). Under Title X (codified as Title IV of the Toxic Substances Control Act [TSCA]), the EPA has established regulations and associated programs in six categories: (1) Training, certification and work practice requirements for persons engaged in Pb-based paint activities (abatement, inspection and risk assessment); accreditation of training providers; and authorization of state and tribal Pb-based paint programs; (2) training, certification, and work practice requirements for persons engaged in home renovation, repair and painting (RRP) activities; accreditation of RRP training providers; and authorization of state and tribal RRP programs; (3) ensuring that, for most housing constructed before 1978, information about Pb-based paint and Pb-based paint hazards flows from sellers to purchasers, from landlords to tenants, and from renovators to owners and occupants; (4) establishing standards for identifying dangerous levels of Pb in paint, dust and soil; (5) providing grant funding to establish and maintain state and tribal Pb-based paint programs; and (6) providing information on Pb hazards to the public, including steps that people can take to protect themselves and their families from Pb-based paint hazards. The most recent rule issued under Title IV of TSCA is for the Lead Renovation, Repair and Painting Program (73 FR 21692, April 22, 2008), which became fully effective in April 2010 and which applies to compensated renovators and maintenance professionals who perform RRP activities in housing and child-care facilities built prior to 1978. To foster adoption of the rule's measures, the EPA has been conducting an extensive education and outreach campaign to promote awareness of these new requirements among both the regulated entities and the consumers who hire them (*http://www2.epa.gov/lead/renovation-repair-and-painting-program*). In addition, the EPA is investigating whether Pb hazards are also created by RRP activities in public and commercial buildings, in which case the EPA plans to issue RRP requirements, where appropriate, for this class of buildings (79 FR 31072, May 30, 2014).

Programs associated with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) and Resource Conservation Recovery Act (RCRA) also implement abatement programs, reducing exposures to Pb and other pollutants. For example, the EPA determines and implements protective levels for Pb in soil at Superfund sites and RCRA corrective action facilities. Federal programs, including those implementing RCRA, provide for management of hazardous substances in hazardous and municipal solid waste (*e.g.*, 66 FR 58258, November 20, 2001). Federal regulations concerning batteries in municipal solid waste facilitate the collection and recycling or proper disposal of batteries containing Pb.[6] Similarly, federal programs provide for the reduction in environmental releases of hazardous substances such as Pb in the management of wastewater (*http://www.epa.gov/owm/*).

A variety of federal nonregulatory programs also provide for reduced environmental release of Pb-containing materials by encouraging pollution prevention, promotion of reuse and recycling, reduction of priority and toxic chemicals in products and waste, and conservation of energy and materials. These include the "Resource Conservation Challenge" (*http://www.epa.gov/epaoswer/osw/conserve/index.htm*), the "National Waste Minimization Program" (*http://www.epa.gov/epaoswer/hazwaste/minimize/leadtire.htm*), "Plug in to eCycling" (a partnership between the EPA and consumer electronics manufacturers and retailers; *http://www.epa.gov/epaoswer/hazwaste/recycle/electron/crt.htm#crts*), and activities to reduce the practice of backyard trash burning (*http://www.epa.gov/msw/backyard/pubs.htm*).

The EPA's research program identifies, encourages and conducts research needed to locate and assess serious risks and to develop methods and tools to characterize and help reduce risks related to Pb exposure. For example, the EPA's Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK model) is widely used and accepted as a tool that informs the evaluation of site-specific data. More recently, in recognition of the need for a single model that predicts Pb concentrations in tissues for children and adults, the EPA has been developing the All Ages Lead Model (AALM) to provide researchers and risk assessors with a pharmacokinetic model capable of estimating blood, tissue, and bone concentrations of Pb based on estimates of exposure over the lifetime of the individual (USEPA, 2006a, sections 4.4.5 and 4.4.8; USEPA, 2013a, section 3.6). The EPA's research activities on substances including Pb, such as those identified here, focus on improving our characterization of health and environmental effects, exposure, and control or management of environmental releases (see *http://www.epa.gov/research/*).

Other federal agencies also participate in programs intended to reduce Pb exposures. For example, programs of the Centers for Disease Control and Prevention (CDC) provide for the tracking of children's blood Pb levels in the U.S. and provide guidance on levels at which medical and environmental case management activities should be implemented (CDC, 2012; ACCLPP, 2012). As a result of coordinated, intensive efforts at the national, state and local levels, including those programs described above, blood Pb levels in all segments of the population have continued to decline from levels observed in the past. For example, blood Pb levels for the general population of children 1 to 5 years of age have dropped to a geometric mean level of 1.17 µg/dL in the 2009–2010 National Health and Nutrition Examination Survey (NHANES) as compared to the geometric mean in 1999–2000 of 2.23 µg/dL and in 1988–1991 of 3.6 µg/dL (USEPA, 2013a, section 3.4.1; USEPA, 2006a, AX4–2). Similarly, blood Pb levels in non-Hispanic black, Mexican American and lower socioeconomic groups, which are generally higher than those for the general population, have

[5] Effective in January 2014, the amount of Pb permitted in pipes, fittings, and fixtures was lowered (see "Summary of the Reduction of Lead in Drinking Water Act and Frequently Asked Questions" at *http://water.epa.gov/drink/info/lead/index.cfm*).

[6] See, *e.g.*, "Implementation of the Mercury-Containing and Rechargeable Battery Management Act" at *http://www.epa.gov/epawaste/hazard/recycling/battery.pdf* and "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2005 *http://www.epa.gov/epawaste/nonhaz/municipal/pubs/msw-2005.pdf*.

also declined (USEPA, 2013a, sections 3.4.1, 5.2.3 and 5.2.4; Jones et al., 2009).

The EPA also participates in a broad range of international programs focused on reducing environmental releases and human exposures in other countries. For example, the Partnership for Clean Fuels and Vehicles program engages governments and stakeholders in developing countries to eliminate Pb in gasoline globally.[7] From 2007 to 2011, the number of countries known to still be using leaded gasoline was reduced from just over 20 to six, with three of the six also offering unleaded fuel. All six were expected to eliminate Pb from fuel in the near future (USEPA, 2011c). The EPA is a contributor to the Globel Alliance to Eliminate Lead Paint, a cooperative initiative jointly led by the World Health Organization and the United Nations Environment Programme (UNEP) to focus and catalyze the efforts to achieve international goals to prevent children's Pb exposure from paints containing Pb and to minimize occupational exposures to Pb paint. This alliance has the broad objective of promoting a phase-out of the manufacture and sale of paints containing Pb and eventually to eliminate the risks that such paints pose. The UNEP is also engaged on the problem of managing wastes containing Pb, including Pb-containing batteries. The Governing Council of the UNEP, of which the U.S. is a member, has adopted decisions focused on promoting the environmentally sound management of products, wastes and contaminated sites containing Pb and reducing risks to human health and the environment from Pb and cadmium throughout the life cycles of those substances (UNEP Governing Council, 2011, 2013). The EPA is also engaged in the issue of environmental impacts of spent Pb-acid batteries internationally through the Commission for Environmental Cooperation (CEC), where the EPA Administrator along with the cabinet-level or equivalent representatives of Mexico and Canada comprise the CEC's senior governing body (CEC Council).[8]

C. Review of the Air Quality Criteria and Standards for Lead

Unlike pollutants such as particulate matter and carbon monoxide, air quality criteria had not been issued for Pb as of the enactment of the CAA of 1970, which first set forth the requirement to set NAAQS based on air quality criteria. In the years just after enactment of the CAA, the EPA did not list Pb under Section 108 of the Act, having determined to control Pb air pollution through regulations to phase out the use of Pb additives in gasoline (See 41 FR 14921, April 8, 1976). However, the decision not to list Pb under Section 108 was challenged by environmental and public health groups, and the U.S. District Court for the Southern District of New York concluded that the EPA was required to list Pb under Section 108. *Natural Resources Defense Council v. EPA*, 411 F. Supp. 864 21 (S.D. N.Y. 1976), affirmed, 545 F.2d 320 (2d Cir. 1978). Accordingly, on April 8, 1976, the EPA published a notice in the **Federal Register** that Pb had been listed under Section 108 as a criteria pollutant (41 FR 14921, April 8, 1976) and on October 5, 1978, the EPA promulgated primary and secondary NAAQS for Pb under Section 109 of the Act (43 FR 46246, October 5, 1978). Both primary and secondary standards were set at a level of 1.5 micrograms per cubic meter (µg/m³), measured as Pb in total suspended particles (Pb–TSP), not to be exceeded by the maximum arithmetic mean concentration averaged over a calendar quarter. These standards were based on the 1977 *Air Quality Criteria for Lead* (USEPA, 1977).

The first review of the Pb standards was initiated in the mid-1980s. The scientific assessment for that review is described in the 1986 *Air Quality Criteria for Lead* (USEPA, 1986a; henceforth referred to as the 1986 CD), the associated Addendum (USEPA, 1986b) and the 1990 Supplement (USEPA, 1990a). As part of the review, the agency designed and performed buman exposure and health risk analyses (USEPA, 1989), the results of which were presented in a 1990 Staff Paper (USEPA, 1990b). Based on the scientific assessment and the human exposure and health risk analyses, the 1990 Staff Paper presented recommendations for consideration by tbe Administrator (USEPA, 1990b). After consideration of the documents developed during the review and the significantly changed circumstances since Pb was listed in 1976, the agency did not propose any revisions to the 1978 Pb NAAQS. In a parallel effort, the agency developed the broad, multi-program, multimedia, integrated *U.S. Strategy for Reducing Lead Exposure* (USEPA, 1991). As part of implementing this strategy, the agency focused efforts primarily on regulatory and remedial clean-up actions aimed at reducing Pb exposures from a variety of nonair sources judged to pose more extensive public health risks to U.S. populations, as well as on actions to reduce Pb emissions to air, such as bringing more areas into compliance with the existing Pb NAAQS (USEPA, 1991). The EPA continues this broad, multi-program, multimedia approach to reducing Pb exposures today, as described in section I.B above.

The last review of the Pb air quality criteria and standards was initiated in November 2004 (69 FR 64926, November 9, 2004); the agency's plans for preparation of the Air Quality Criteria Document and conduct of the NAAQS review were presented in documents completed in 2005 and early 2006 (USEPA, 2005a; USEPA 2006b).[9] The schedule for completion of the review was governed by a judicial order in *Missouri Coalition for the Environment v. EPA* (No. 4:04CV00660 ERW, September 14, 2005; and amended on April 29, 2008 and July 1, 2008).

The scientific assessment for the review is described in the 2006 *Air Quality Criteria for Lead* (USEPA, 2006a; henceforth referred to as the 2006 CD), multiple drafts of which received review by CASAC and the public. The EPA also conducted human exposure and health risk assessments and a pilot ecological risk assessment for the review, after consultation with CASAC and receiving public comment on a draft analysis plan (USEPA, 2006c). Drafts of these quantitative assessments were reviewed by CASAC and the public. The pilot ecological risk assessment was released in December 2006 (ICF International, 2006), and the final health risk assessment report was released in November 2007 (USEPA, 2007a). The policy assessment, based on both of these assessments, air quality analyses and key evidence from the 2006 CD, was presented in the Staff Paper (USEPA, 2007b), a draft of which also received CASAC and public review. The final Staff Paper presented OAQPS staff's evaluation of the public health and walfare policy implications of the key studies and scientific information contained in the 2006 CD and presented and interpreted results from the quantitative risk/exposure analyses

[7] International programs in which the U.S. participates, including those identified here, are described at: *http://epa.gov/international/air/pcfv.html*, *http://www.unep.org/transport/pcfv/*, *http://www.unep.org/hazardoussubstances/Home/tabid/197/hazardoussubstances/LeadCadmium/PrioritiesforAction/GAELP/tabid/6176/Default.aspx*.

[8] The CEC was established to support cooperation among the North American Free Trade Agreement partners to address environmental issues of continental concern, including the environmental challenges and opportunities presented by continent-wide free trade.

[9] In the current review, these two documents have been combined in the *Integrated Review Plan for the National Ambient Air Quality Standards for Lead* (USEPA, 2011a).

conducted for this review. Based on this evaluation, the Staff Paper presented OAQPS staff recommendations that the Administrator give consideration to substantially revising the primary and secondary standards to a range of levels at or below 0.2 µg/m³.

Immediately subsequent to completion of the Staff Paper, the EPA issued an advance notice of proposed rulemaking (ANPR) that was signed by the Administrator on December 5, 2007 (72 FR 71488, December 17, 2007).[10] CASAC provided advice and recommendations to the Administrator with regard to the Pb NAAQS based on its review of the ANPR and the previously released final Staff Paper and risk assessment reports. In 2008, the proposed decision on revisions to the Pb NAAQS was signed on May 1 and published in the **Federal Register** on May 20 (73 FR 29184, May 20, 2008). Members of the public provided comments and the CASAC Pb Panel also provided advice and recommendations to the Administrator based on its review of the proposal notice. The final decision on revisions to the Pb NAAQS was signed on October 15, 2008, and published in the **Federal Register** on November 12, 2008 (73 FR 66964, November 12, 2008).

The November 2008 notice described the EPA's decision to revise the primary and secondary NAAQS for Pb, as discussed more fully in section II.A.1 below. In consideration of the much-expanded health effects evidence on neurocognitive effects of Pb in children, the EPA substantially revised the primary standard from a level of 1.5 µg/m³ to a level of 0.15 µg/m³. The averaging time was revised to a rolling 3-month period with a maximum (not-to-be-exceeded) form, evaluated over a 3-year period. The indicator of Pb–TSP was retained, reflecting the evidence that Pb particles of all sizes pose health risks. The secondary standard was revised to be identical in all respects to the revised primary standard (40 CFR 50.16). Revisions to the NAAQS were accompanied by revisions to the data handling procedures, the treatment of exceptional events and the ambient air monitoring and reporting requirements, as well as emissions inventory reporting requirements. One aspect of the revised data handling requirements is the allowance for the use of monitoring for particulate matter with mean diameter below 10 microns (Pb–PM_{10}) for Pb NAAQS attainment purposes in certain limited circumstances at non-source-oriented sites. Subsequent to the 2008 rulemaking, additional revisions were made to the monitoring network requirements (75 FR 81126, December 27, 2010). Guidance on the approach for implementation of the new standards was described in the **Federal Register** notices for the proposed and final rules (73 FR 29184, May 20, 2008; 73 FR 66964, November 12, 2008).

On February 26, 2010, the EPA formally initiated its current review of the air quality criteria and standards for Pb, requesting the submission of recent scientific information on specified topics (75 FR 8934, February 26, 2010). Soon after this, the EPA held a workshop to discuss the policy-relevant science, which informed identification of key policy issues and questions to frame the review of the Pb NAAQS (75 FR 20843, April 21, 2010). Drawing from the workshop discussions, the EPA developed the draft Integrated Review Plan (draft IRP, USEPA, 2011d). The draft IRP was made available in late March 2011 for consultation with the CASAC Pb Review Panel and for public comment (76 FR 20347, April 12, 2011). This document was discussed by the Panel via a publicly accessible teleconference consultation on May 5, 2011 (76 FR 21346, April 15, 2011; Frey, 2011a). The final *Integrated Review Plan for the National Ambient Air Quality Standards for Lead* (IRP), developed in consideration of the CASAC consultation and public comment, was released in November 2011 (USEPA, 2011a; 76 FR 76972, December 9, 2011).

In developing the Integrated Science Assessment (ISA) for this review, the EPA held a workshop in December 2010 to discuss with invited scientific experts preliminary draft materials and released the first external review draft of the document for CASAC review and public comment in May 2011 (USEPA, 2011e; 76 FR 26284, May 6, 2011; 76 FR 36120, June 21, 2011). The CASAC Pb Review Panel met at a public meeting on July 20, 2011, to review the draft ISA (76 FR 36120, June 21, 2011). The CASAC provided comments in a December 9, 2011, letter to the EPA Administrator (Frey and Samet, 2011). The second external review draft ISA was released for CASAC review and public comment in February 2012 (USEPA, 2012a; 77 FR 5247, February 2, 2012) and was the subject of a public meeting on April 10–11, 2012 (77 FR 14783, March 13, 2012). The CASAC provided comments in a July 20, 2012, letter (Samet and Frey, 2012). The third external review draft was released for CASAC review and public comment in November 2012 (USEPA, 2012b; 77 FR 70776, November 27, 2012) and was the subject of a public meeting on February 5–6, 2013 (78 FR 938, January 7, 2013). The CASAC provided comments in a June 4, 2013, letter (Frey, 2013a). The final ISA was released in late June 2013 (USEPA, 2013a, henceforth referred to as the ISA; 78 FR 38318, June 26, 2013).

In June 2011, the EPA developed and released the *Risk and Exposure Assessment Planning Document* (REA Planning Document) for consultation with CASAC and public comment (USEPA, 2011b; 76 FR 58509). This document presented a critical evaluation of the information related to Pb human and ecological exposure and risk (*e.g.*, data, modeling approaches) newly available in this review, with a focus on consideration of the extent to which new or substantially revised REAs for health and ecological risk might be warranted by the newly available evidence. Evaluation of the newly available information with regard to designing and implementing health and ecological REAs for this review led us to conclude that the currently available information did not provide a basis for developing new quantitative risk and exposure assessments that would have substantially improved utility for informing the agency's consideration of health and welfare effects and evaluation of the adequacy of the current primary and secondary standards, respectively (REA Planning Document, sections 2.3 and 3.3, respectively). The CASAC Pb Review Panel provided consultative advice on that document and its conclusions at a public meeting on July 21, 2011 (76 FR 36120, June 21, 2011; Frey, 2011b). Based on their consideration of the REA Planning Document analysis, the CASAC Pb Review Panel generally concurred with the conclusion that a new REA was not warranted in this review (Frey, 2011b; Frey, 2013b). In consideration of the conclusions reached in the REA Planning Document and CASAC's consultative advice, the EPA has not developed REAs for health and ecological risk for this review. Accordingly, we consider the risk assessment findings from the last review for human exposure and health risk (USEPA, 2007a, henceforth referred to as the 2007 REA) and ecological risk (ICF International, 2006; henceforth referred to as the 2006 REA) with regard to any appropriate further interpretation in light of the evidence newly available in this review.

A draft of the Policy Assessment (PA) was released for public comment and review by CASAC in January 2013 (USEPA, 2013b; 77 FR 70776, November 27, 2012) and was the subject of a public meeting on February 5–6, 2013 (78 FR 938, January 7, 2013). Comments provided by the CASAC in a June 4, 2013 letter (Frey, 2013b), as well as public comments received on the draft PA were considered in preparing the final PA, which was released in May 2014 (USEPA, 2014; 79 FR 26751, May 9, 2014).

[10] The ANPR, one of the features of the revised NAAQS review process that EPA instituted in 2006, was replaced by reinstatement of the Policy Assessment prepared by OAQPS staff (previously termed the OAQPS Staff Paper) in 2009 (Jackson, 2009).

D. Multimedia, Multipathway Aspects of Lead

Since Pb distributes from air to other media and is persistent, our review of the NAAQS for Pb considers the protection provided against such effects associated both with exposures to Pb in ambient air and with exposures to Pb that makes its way into other media from ambient air. Additionally, in assessing the adequacy of protection afforded by the current NAAQS, we are mindful of the long history of greater and more widespread atmospheric emissions that occurred in previous years (both before and after establishment of the 1978 NAAQS) and that contributed to the Pb that exists in human populations and ecosystems today. Likewise, we also recognize the role of other, nonair sources of Pb now and in the past that also contribute to the Pb that exists in human populations and ecosystems today.

Lead emitted to ambient air is transported through the air and is also distributed from air to other media. This multimedia distribution of Pb emitted into ambient air (air-related Pb) contributes to multiple air-related pathways of human and ecosystem exposure (ISA, sections 3.1 and 3.7.1). Air-related pathways may also involve media other than air, including indoor and outdoor dust, soil, surface water and sediments, vegetation and biota. Air-related Pb exposure pathways for humans include inhalation of ambient air or ingestion of food, water or other materials, including dust and soil, that have been contaminated through a pathway involving Pb deposition from ambient air (ISA, section 3.1.1.1). Ambient air inhalation pathways include both inhalation of air outdoors and inhalation of ambient air that has infiltrated into indoor environments. The air-related ingestion pathways occur as a result of Pb passing through the ambient air, being distributed to other environmental media and contributing to human exposures via contact with and ingestion of indoor and outdoor dusts, outdoor soil, food and drinking water.

Lead exposures via the various inhalation and ingestion air-related pathways may vary with regard to the time in which they respond to changes in air Pb concentrations. For example, exposures resulting from human exposure pathways most directly involving Pb in ambient air and exchanges of ambient air with indoor air (*e.g.*, inhalation) can respond most quickly, while those for pathways involving exposure to Pb deposited from ambient air into the environment (*e.g.*, diet) may be expected to respond more slowly. The extent of this will be influenced by the magnitude of change, as well as—for deposition-related pathways—the extent of prior deposition and environment characteristics influencing availability of prior deposited Pb.

Lead currently occurring in nonair media may also derive from sources other than ambient air (nonair Pb sources) (ISA, sections 2.3 and 3.7.1). For example, Pb in dust inside some houses or outdoors in some urban areas may derive from the common past usage of leaded paint, while Pb in drinking water may derive from the use of leaded pipe or solder in drinking water distribution systems (ISA, section 3.1.3.3). We also recognize the history of much greater air emissions of Pb in the past, such as that associated with leaded gasoline usage and higher industrial emissions which have left a legacy of Pb in other (nonair) media.

The relative importance of different pathways of human exposure to Pb, as well as the relative contributions from Pb resulting from recent and historic air emissions and from nonair sources, vary across the U.S. population as a result of both extrinsic factors, such as a home's proximity to industrial Pb sources or its history of leaded paint usage, and intrinsic factors, such as a person's age and nutritional status (ISA, sections 5.1, 5.2, 5.2.1, 5.2.5 and 5.2.6). Thus, the relative contributions from specific pathways is situation specific (ISA, p. 1–11), although a predominant Pb exposure pathway for very young children is the incidental ingestion of indoor dust by hand-to-mouth activity (ISA, section 3.1.1.1). For adults, however, diet may be the primary Pb exposure pathway (2006 CD, section 3.4). Similarly, the relative importance of air-related and nonair-related Pb also varies with the relative magnitudes of exposure by those pathways, which may vary with different circumstances.

The distribution of Pb from ambient air to other environmental media also influences the exposure pathways for organisms in terrestrial and aquatic ecosystems. Exposure of terrestrial animals and vegetation to air-related Pb can occur by contact with ambient air or by contact with soil, water or food items that have been contaminated by Pb from ambient air (ISA, section 6.2). Transport of Pb into aquatic systems similarly provides for exposure of biota in those systems, and exposures may vary among systems as a result of differences in sources and levels of contamination, as well as characteristics of the systems themselves, such as salinity, pH and turbidity (ISA, section 2.3.2). In addition to Pb contributed by current atmospheric deposition, Pb may occur in aquatic systems as a result of nonair sources such as industrial discharges or mine-related drainage, of historical air Pb emissions (*e.g.*, contributing to deposition to a water body or via runoff from soils near historical air sources) or combinations of different types of sources (*e.g.*, resuspension of sediments contaminated by urban runoff and surface water discharges).

The persistence of Pb contributes an important temporal aspect to lead's environmental pathways, and the time (or lag) associated with realization of the impact of air Pb concentrations on concentrations in other media can vary with the media (*e.g.*, ISA, section 6.2.2). For example, exposure pathways most directly involving Pb in ambient air or surface waters can respond more quickly to changes in ambient air Pb concentrations while pathways involving exposure to Pb in soil or sediments generally respond more slowly. An additional influence on the response time for nonair media is the environmental presence of Pb associated with past, generally higher, air concentrations. For example, after a reduction in air Pb concentrations, the time needed for sediment or surface soil concentrations to indicate a response to reduced air Pb concentrations might be expected to be longer in areas of more substantial past contamination than in areas with lesser past contamination. Thus, considering the Pb concentrations occurring in nonair environmental media as a result of air quality conditions that meet the current NAAQS is a complexity of this review, as it also was, although to a lesser degree, with regard to the prior standard in the last review.

E. Air Quality Monitoring

Lead emitted to the air is predominantly in particulate form. Once emitted, particle-bound Pb can be transported long or short distances depending on particle size, which influences the amount of time spent in the aerosol phase. In general, larger particles tend to deposit more quickly, within shorter distances from emissions points, while smaller particles remain in aerosol phase and travel longer distances before depositing (ISA, section 1.2.1). Accordingly, airborne concentrations of Pb near sources are much higher (and the representation of larger particles generally greater) than at sites not directly influenced by sources (PA, Figure 2–11; ISA sections 2.3.1 and 2.5.3).

Ambient air monitoring data for Pb, in terms of Pb–TSP, Pb–PM_{10} or Pb in particulate matter with mean diameter smaller than 2.5 microns (Pb–$PM_{2.5}$), are currently collected in several national networks. Monitoring conducted for purposes of Pb NAAQS surveillance is regulated to ensure accurate and comparable data for determining compliance with the NAAQS. In order to be used in NAAQS attainment designations, ambient Pb concentration data must be obtained using either the federal reference method (FRM) or a federal equivalent method (FEM). The FRMs for sample collection and analysis are specified in 40 CFR part 50. The procedures for approval of FRMs and FEMs are specified in 40 CFR part 53. In 2013, after consultation with CASAC's Ambient Air Monitoring and Methods Subcommittee, the EPA adopted a new FRM for Pb–TSP, based on inductively coupled plasma-mass spectrometry (78 FR 40000, July 3, 2013). The previous FRM was retained as an FEM, and existing FEMs were retained as well.

The Pb monitoring network design requirements (40 CFR part 58, Appendix D, paragraph 4.5) include two types of monitoring sites—source-oriented monitoring sites and non-source-oriented monitoring sites—as well as the collection of a year of Pb–TSP measurements at 15 specific airports. The indicator for the current Pb NAAQS is Pb–TSP, although in some situations,[11] ambient Pb–PM_{10} concentrations may be used in judging nonattainment. Currently, approximately 260 Pb–TSP monitors are in operation; these are a mixture of source- and non-source-oriented monitors.

Since the phase-out of Pb in on-road gasoline, Pb is widely recognized as a source-oriented air pollutant. Variability in air Pb concentrations is highest in areas including a Pb source, "with high concentrations downwind of the sources and low concentration at areas far from sources" (ISA, p. 2–92). The current requirements for source-oriented monitoring include placement of monitor sites near sources of air Pb emissions which are expected to or have been shown to contribute to ambient air Pb concentrations in excess of the NAAQS. At a minimum, there must be one source-oriented site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons of Pb per year and from each airport which emits 1.0 or more tons of Pb per year.[12] The EPA Regional Administrators may require additional monitoring beyond the minimum requirements where the likelihood of Pb air quality violations is significant. Such locations may include those near additional industrial Pb sources, recently closed industrial sources and other sources of resuspended Pb dust, as well as airports where piston-engine aircraft emit Pb associated with combustion of leaded aviation fuel (40 CFR part 58, Appendix D, section 4.5(c)). A single year of monitoring was also required near 15 specific airports[13] in order to gather additional information on the likelihood of NAAQS exceedances due to the combustion of leaded aviation gasoline (75 FR 81126, December 27, 2010; 40 CFR part 58, Appendix D, 4.5(a)(iii)). These airport monitoring data along with other data gathering and analyses will inform the EPA's ongoing investigation into the potential for Pb emissions from piston-engine aircraft to cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare. This investigation is occurring under section 231 of the CAA, separate from the Pb NAAQS review. As a whole, the various data gathering and analyses are expected to improve our understanding of Pb concentrations in ambient air near airports and conditions influencing these concentrations.

Monitoring agencies are also required, under 40 CFR part 58, Appendix D, to conduct non-source-oriented Pb monitoring at the NCore sites[14] required in metropolitan areas with a population of 500,000 or more (as defined by the U.S. Census Bureau).[15] Either Pb–TSP or Pb–PM_{10} monitoring may be performed at these sites. Currently, all 50 NCore Pb sites are operational and measuring Pb concentrations, with 28 measuring Pb in TSP and 24 measuring Pb in PM_{10} (2 sites are measuring both Pb in TSP and Pb in PM_{10}). In a separate action addressing a range of issues related to monitoring requirements for criteria pollutants, the EPA is proposing to remove the requirement for Pb monitoring at NCore sites (79 FR 54395, September 11, 2014). This change is being proposed in consideration of current information indicating concentrations at these sites to be well below the Pb NAAQS and of the presence of other monitoring networks that provide information on Pb concentrations in urban areas not directly impacted by Pb sources. The data available for these sites indicate maximum 3-month average concentrations (of Pb–PM_{10} or Pb–TSP) well below the level of the Pb NAAQS, with the vast majority of sites showing concentrations less than 0.01 μg/m³. Additionally, other monitoring networks provide data on Pb in PM_{10} or $PM_{2.5}$ at non-source-oriented urban, and some rural, sites. These include the National Air Toxics Trends Stations for PM_{10} and the Chemical Speciation Network for $PM_{2.5}$. Data on Pb in $PM_{2.5}$ are also provided at the rural sites of the Interagency Monitoring of Protected Visual Environments network.

The long-term record of Pb monitoring data documents the dramatic decline in atmospheric Pb concentrations that has occurred since the 1970s in response to reduced emissions (PA, Figures 2–1 and 2–7). Currently, the highest concentrations occur near some metals industries where some individual locations have concentrations that exceed the NAAQS (PA, Figure 2–10). Concentrations at non-source-oriented monitoring sites are much lower than those at source-oriented sites and well below the standard (PA, Figure 2–11).

[11] The Pb–PM_{10} measurements may be used for NAAQS monitoring as an alternative to Pb–TSP measurements in certain conditions defined in 40 CFR part 58, Appendix C, section 2.10.1.2. These conditions include where Pb concentrations are not expected to equal or exceed 0.10 μg/m³ as an arithmetic 3-month mean and where the source of Pb emissions is expected to emit a substantial majority of its Pb in the size fraction captured by PM_{10} monitors.

[12] The Regional Administrator may waive this requirement for monitoring near Pb sources if the state or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum 3-month average Pb concentration in ambient air in excess of 50 percent of the NAAQS level based on historical monitoring data, modeling, or other means (40 CFR part 58, Appendix D, section 4.5(a)(ii)).

[13] These airports were selected based on three criteria: annual Pb inventory between 0.5 ton/year and 1.0 ton/year, ambient air within 150 meters of the location of maximum emissions (*e.g.*, the end of the runway or run-up location), and airport configuration and meteorological scenario that leads to a greater frequency of operations from one runway. These criteria are expected, collectively, to identify airports with the highest potential to have ambient air Pb concentrations approaching or exceeding the Pb NAAQS (75 FR 81126).

[14] The NCore network, that formally began in January 2011, is a subset of the state and local air monitoring stations network that is intended to meet multiple monitoring objectives (*e.g.*, long-term trends analysis, model evaluation, health and ecosystem studies, as well as NAAQS compliance). The complete NCore network consists of 63 urban and 15 rural stations, with each state containing at least one NCore station; 46 of the states plus Washington, DC and Puerto Rico have at least one urban station.

[15] *http://www.census.gov/population/www/metroareas/metroarea.html*.

II. Rationale for Proposed Decision on the Primary Standard

This section presents the rationale for the Administrator's proposed decision to retain the existing Pb primary standard. As discussed more fully below, this rationale is based on a thorough review, in the ISA, of the latest scientific information, generally published through September 2011,[16] on human health effects associated with Pb and pertaining to the presence of Pb in the ambient air. This proposal also takes into account: (1) The PA's staff assessments of the most policy-relevant information in the ISA and staff analyses of air quality, human exposure and health risks, upon which staff conclusions regarding appropriate considerations in this review are based; (2) CASAC advice and recommendations, as reflected in discussions of drafts of the ISA and PA at public meetings, in separate written comments, and in CASAC's letters to the Administrator; and (3) public comments received during the development of these documents, either in connection with CASAC meetings or separately.

In presenting the rationale and its foundations, section II.A provides background on the general approach for review of the primary NAAQS for Pb, including a summary of the approach used in the last review (section II.A.1) and the general approach for the current review (section II.A.2). Sections II.B and II.C summarize the body of evidence supporting this rationale, focusing on consideration of key policy-relevant questions, and section II.D summarizes the exposure/risk information for this review. Section II.E presents the Administrator's proposed conclusions on adequacy of the current standard, drawing on both evidence-based and exposure/risk-based considerations (sections II.E.1 and II.E.2), and advice from CASAC (section II.E.3).

A. General Approach

The past and current approaches described below are both based, most fundamentally, on using the EPA's assessment of the current scientific evidence and associated quantitative analyses to inform the Administrator's judgment regarding a primary standard for Pb that protects public health with an adequate margin of safety. We note that in drawing conclusions with regard to the primary standard, the final decision on the adequacy of the current standard is largely a public health policy judgment to be made by the Administrator. The Administrator's final decision must draw upon scientific information and analyses about health effects, population exposure and risks, as well as judgments about how to consider the range and magnitude of uncertainties that are inherent in the scientific evidence and analyses. Our approach to informing these judgments, discussed more fully below, is based on the recognition that the available health effects evidence generally reflects a continuum, consisting of levels at which scientists generally agree that health effects are likely to occur, through lower levels at which the likelihood and magnitude of the response become increasingly uncertain. This approach is consistent with the requirements of the NAAQS provisions of the Act and with how the EPA and the courts have historically interpreted the Act. These provisions require the Administrator to establish primary standards that, in the judgment of the Administrator, are requisite to protect public health with an adequate margin of safety. In so doing, the Administrator seeks to establish standards that are neither more nor less stringent than necessary for this purpose. The Act does not require that primary standards be set at a zero-risk level, but rather at a level that avoids unacceptable risks to public health including the health of sensitive groups.[17] The four basic elements of the NAAQS (indicator, averaging time, level, and form) are considered collectively in evaluating the health protection afforded by the current standard.

1. Approach in the Last Review

The last review of the NAAQS for Pb was completed in 2008 (73 FR 66964, November 12, 2008). The 2008 decision to substantially revise the primary standard was based on the extensive body of scientific evidence published over almost three decades, from the time the standard was originally set in 1978 through 2005–2006. In so doing, the 2008 decision considered the body of evidence as assessed in the 2006 CD (USEPA, 2006a), as well as the 2007 Staff Paper assessment of the policy-relevant information contained in the CD and the quantitative risk/exposure assessment (USEPA, 2007a, 2007b), the advice and recommendations of CASAC (Henderson 2007a, 2007b, 2008a, 2008b), and public comment. While recognizing that Pb has been demonstrated to exert "a broad array of deleterious effects on multiple organ systems," the review focused on the effects most pertinent to ambient air exposures, which given ambient air Pb reductions over the past 30 years, are those associated with relatively lower exposures and associated blood Pb levels (73 FR 66975, November 12, 2008). In so doing, the EPA recognized the general consensus that the developing nervous system in children is among the most sensitive health endpoints associated with Pb exposure, if not the most sensitive one. Thus, primary attention was given to consideration of nervous system effects, including neurocognitive and neurobehavioral effects, in children (73 FR 66976, November 12, 2008). The body of evidence included associations of such effects in study populations of variously aged children with mean blood Pb levels below 10 μg/dL, extending from 8 down to 2 μg/dL (73 FR 66976, November 12, 2008). The public health implications of effects of air-related Pb on cognitive function (*e.g.*, IQ) in young children were given particular focus in the review.

The conclusions reached by the Administrator in the last review were based primarily on the scientific evidence, with the risk- and exposure-based information providing support for various aspects of the decision. In reaching his conclusion on the adequacy of the then-current standard, which was set in 1978, the Administrator placed primary consideration on the large body of scientific evidence available in the review including significant new evidence concerning effects at blood Pb concentrations substantially below those identified when the standard was initially set (73 FR 66987, November 12, 2008; 43 FR 46246, October 5, 1978). Given particular attention was the robust evidence of neurotoxic effects of Pb exposure in children, recognizing: (1) That while blood Pb levels in U.S. children had decreased notably since the late 1970s, newer epidemiological studies had investigated and reported

[16] In addition to the review's opening "call for information" (75 FR 8934), "literature searches were conducted routinely to identify studies published since the last review, focusing on studies published from 2006 (close of the previous scientific assessment) through September 2011," and references "that were considered for inclusion or actually cited in this ISA can be found at *http://hero.epa.gov/lead*" (ISA, p. 1–2).

[17] The at-risk population groups identified in a NAAQS review may include low-income or minority groups. Where low-income/minority groups are among the at-risk populations, the rulemaking decision will be based on providing protection for these and other at-risk populations and lifestages (*e.g.*, children, older adults, persons with pre-existing heart and lung disease). To the extent that low-income/minority groups are not among the at-risk populations identified in the ISA, a decision based on providing protection of the at-risk lifestages and populations would be expected to provide protection for the low-income/minority groups.

associations of effects on the neurodevelopment of children with those more recent lower blood Pb levels and (2) that the toxicological evidence included extensive experimental laboratory animal evidence substantiating well the plausibility of the epidemiological findings observed in human children and expanding our understanding of likely mechanisms underlying the neurotoxic effects (73 FR 66987, November 12, 2008). Additionally, within the range of blood Pb levels investigated in the available evidence base, a threshold level for neurocognitive effects was not identified (73 FR 66984, November 12, 2008; 2006 CD, p. 8–67). Further, the evidence indicated a steeper concentration-response (C–R) relationship for effects on cognitive function at those lower blood Pb levels than at higher blood Pb levels that were more common in the past, "indicating the potential for greater incremental impact associated with exposure at these lower levels" (73 FR 66987, November 12, 2008). As at the time when the standard was initially set in 1978, the health effects evidence and exposure/risk assessment available in the last review supported the conclusion that air-related Pb exposure pathways contribute to blood Pb levels in young children by inhalation and ingestion (73 FR 66987, November 12, 2008). The available information in the last review also indicated, however, a likely greater change in blood Pb per unit of air Pb than was estimated when the standard was initially set (73 FR 66987, November 12, 2008).

In the Administrator's decision on the adequacy of the 1978 standard, the Administrator considered the evidence using a very specifically defined framework, referred to as an air-related IQ loss evidence-based framework. This framework integrates evidence for the relationship between Pb in air and Pb in young children's blood with evidence for the relationship between Pb in young children's blood and IQ loss (73 FR 66987, November 12, 2008). This evidence-based approach considers air-related effects on neurocognitive function (using the quantitative metric of IQ loss) associated with exposure in those areas with elevated air concentrations equal to potential alternative levels for the Pb standard. In simplest terms, the framework focuses on children exposed to air-related Pb in those areas with elevated air Pb concentrations equal to specific potential standard levels, providing for estimation of a mean air-related IQ decrement for young children in the high end of the national distribution of air-related exposures. Thus, the conceptual context for the framework is that it provides estimates of air-related IQ loss for the subset of U.S. children living in close proximity to air Pb sources that contribute to such elevated air Pb concentrations. In such cases, when a standard of a particular level is just met at a monitor sited to record the highest source-oriented concentration in an area, the large majority of children in the larger surrounding area would likely experience exposures to concentrations well below that level.

The two primary inputs to the evidence-based air-related IQ loss framework are air-to-blood ratios and C–R functions for the relationship between blood Pb and IQ response in young children. Additionally taken into consideration in applying and drawing conclusions from the framework were the uncertainties inherent in these inputs. Application of the framework also entailed consideration of an appropriate level of protection from air-related IQ loss to be used in conjunction with the framework. The framework estimates of mean air-related IQ loss are derived through multiplication of the following factors: standard level (µg/m^3), air-to-blood ratio (albeit in terms of µg/dL blood Pb per µg/m^3 air concentration), and slope for the C–R function in terms of points IQ decrement per µg/dL blood Pb.

Based on the application of the air-related IQ loss framework to the evidence, the Administrator concluded that, for exposures projected for air Pb concentrations at the level of the 1978 standard, the quantitative estimates of IQ loss associated with air-related Pb indicated risk of a magnitude that, in his judgment, was significant from a public health perspective, and that the evidence-based framework supported a conclusion that the 1978 standard did not protect public health with an adequate margin of safety (73 FR 66987, November 12, 2008). The Administrator further concluded that the evidence indicated the need for a substantially lower standard level to provide increased public health protection, especially for at-risk groups (most notably children), against an array of effects, most importantly including effects on the developing nervous system (73 FR 66987, November 12, 2008). In addition to giving primary consideration to the much expanded evidence base since the standard was set, the Administrator also took into consideration the exposure/risk assessments. In so doing, he observed that, while taking into consideration their inherent uncertainties and limitations, the quantitative estimates of IQ loss associated with air-related Pb in air quality scenarios just meeting the then-current standard also indicated risk of a magnitude that, in his judgment, was significant from a public health perspective. Thus, the Administrator concluded the exposure/risk estimates provided additional support to the evidence-based conclusion that the standard needed revision (73 FR 66987, November 12, 2008).

In considering appropriate revisions to the prior standard in the review completed in 2008, each of the four basic elements of the NAAQS (indicator, averaging time, form and level) was evaluated. The rationale for decisions on those elements is summarized below.

With regard to indicator, consideration was given to replacing Pb–TSP with Pb–PM_{10}. The EPA recognized, however, that Pb in all particle sizes contributes to Pb in blood and associated health effects, additionally noting that the difference in particulate Pb captured by TSP and PM_{10} monitors may be on the order of a factor of two in some areas (73 FR 66991, November 12, 2008). Further, the Administrator recognized uncertainty with regard to whether a Pb–PM_{10}-based standard would also effectively control ultra-coarse[18] Pb particles, which may have a greater presence in areas near sources where Pb concentrations are highest (73 FR 66991, November 12, 2008). The Administrator decided to retain Pb–TSP as the indicator to provide sufficient public health protection from the range of particle sizes of ambient air Pb, including ultra-coarse particles (73 FR 66991, November 12, 2008). Additionally, a role was provided for Pb–PM_{10} in the monitoring required for a Pb–TSP standard (73 FR 66991, November 12, 2008) based on the conclusion that use of Pb–PM_{10} measurements at sites not influenced by sources of ultra-coarse Pb, and where Pb concentrations are well below the standard, would take advantage of the increased precision of these measurements and decreased spatial variation of Pb–PM_{10} concentrations, without raising the same concerns over a lack of protection against health risks from all particulate Pb emitted to the ambient air that

[18] The term "ultra-coarse" refers to particles collected by a TSP sampler but not by a PM_{10} sampler. This terminology is consistent with the traditional usage of "fine" to refer to particles collected by a $PM_{2.5}$ sampler, and "coarse" to refer to particles collected by a PM_{10} sampler but not by a $PM_{2.5}$ sampler, recognizing that there will be some overlap in the particle sizes in the three types of collected material.

support retention of Pb–TSP as the indicator (versus revision to Pb–PM_{10}) (73 FR 66991, November 12, 2008). Accordingly, allowance was made for the use of Pb–PM_{10} monitoring for Pb NAAQS attainment purposes in certain limited circumstances, at non-source-oriented sites, where the Pb concentrations are expected to be substantially below the standard and ultra-coarse particles are not expected to be present (73 FR 66991, November 12, 2008).

With regard to averaging time and form for the revised standard, consideration was given to a monthly averaging time, with a form of second maximum, and to 3-month and calendar quarter averaging times, with not-to-be exceeded forms. While the Administrator recognized that there were some factors that might imply support for a period as short as a month for averaging time, he also noted other factors supporting use of a longer time. He additionally took note of the complexity inherent in this consideration for the primary Pb standard, which is greater than in the case of other criteria pollutants due to the multimedia nature of Pb and its multiple pathways of human exposure. In this situation for Pb, the Administrator emphasized the importance of considering all of the relevant factors, both those pertaining to the human physiological response to changes in Pb exposures and those pertaining to the response of air-related Pb exposure pathways to changes in airborne Pb, in an integrated manner.

As discussed further in the PA, the evidence on human physiological response to changes in Pb exposure available in the last review indicated that children's blood Pb levels respond quickly to increased Pb exposure, particularly during the time of leaded gasoline usage but likely with lessened immediacy since that time as children's exposure pathways have changed (PA, section 4.1.1.2). The Administrator also recognized limitations and uncertainties in the evidence and variability with regard to the information regarding the response time of indoor dust Pb to ambient airborne Pb. In consideration of the uncertainty associated with the evidence, the Administrator noted that the two changes in form for the standard (to a rolling 3-month average and to providing equal weighting to each month in deriving the 3-month average) both afford greater weight to each individual month than did the calendar quarter form of the 1978 standard, tending to control both the likelihood that any month will exceed the level of the standard and the magnitude of any such exceedance. Thus, based on an integrated consideration of the range of relevant factors, the averaging time was revised to a rolling 3-month period with a maximum (not-to-be-exceeded) form, evaluated over a 3-year period. As compared to the previous averaging time and form of calendar quarter (not-to-be exceeded), this revision was considered to be more scientifically appropriate and more health protective (73 FR 66996, November 12, 2008). The rolling average gives equal weight to all 3-month periods, and the new calculation method gives equal weight to each month within each 3-month period (73 FR 66996, November 12, 2008). Further, the rolling average yields twelve 3-month averages each year to be compared to the NAAQS versus four averages in each year for the block calendar quarters pertaining to the previous standard (73 FR 66996, November 12, 2008).

Lastly, based on the body of scientific evidence and information available, as well as CASAC recommendations and public comment, the Administrator decided on a standard level that, in combination with the specified choice of indicator, averaging time, and form, he judged requisite to protect public health, including the health of sensitive groups, with an adequate margin of safety (73 FR 67006, November 12, 2008). In reaching the decision on level for the revised standard, the Administrator considered as a useful guide the evidence-based framework developed in that review. As described above, that framework integrates evidence for the relationship between Pb in air and Pb in children's blood and the relationship between Pb in children's blood and IQ loss. Application of the air-related IQ loss evidence-based framework was recognized, however, to provide "no evidence- or risk-based bright line that indicates a single appropriate level" for the standard (73 FR 67006, November 12, 2008). Rather, the framework was seen as a useful guide for consideration of health risks from exposure to ambient levels of Pb in the air, in the context of a specified averaging time and form, with regard to the Administrator's decision on a level for a revised NAAQS that provides public health protection that is sufficient but not more than necessary under the Act (73 FR 67004, November 12, 2008).

As noted above, use of the evidence-based air-related IQ loss framework to inform selection of a standard level involved consideration of the evidence with regard to two input parameters. The two input parameters are an air-to-blood ratio and a C–R function for population IQ response associated with blood Pb level (73 FR 67004, November 12, 2008). The evidence at the time of the last review indicated a broad range of air-to-blood ratio estimates,[19] each with limitations and associated uncertainties. Based on the then-available evidence, the Administrator concluded that 1:5 to 1:10 represented a reasonable range to consider and identified 1:7 as a generally central value on which to focus (73 FR 67004, November 12, 2008). With regard to C–R functions, in light of the evidence of nonlinearity and of steeper slopes at lower blood Pb levels, the Administrator concluded it was appropriate to focus on C–R analyses based on blood Pb levels that most closely reflected the then-current population of children in the U.S.,[20] recognizing the EPA's identification of four such analyses and giving weight to the central estimate or median of the resultant C–R functions (73 FR 67003, November 12, 2008, Table 3; 73 FR 67004, November 12, 2008). The median estimate for the four C–R slopes of −1.75 IQ points decrement per µg/dL blood Pb was selected for use with the framework. With the framework, potential alternative standard levels (µg/m^3) are multiplied by estimates of air-to-blood ratio (µg/dL blood Pb per µg/m^3 air Pb) and the median slope for the C–R function (points IQ decrement per µg/dL blood Pb), yielding estimates of a mean air-related IQ decrement for a specific subset of young children (*i.e.*, those children exposed to air-related Pb in areas with elevated air Pb concentrations equal to specified alternative levels). As such, the application of the framework yields estimates for the mean air-related IQ decrements of the subset of children expected to experience air-related Pb exposures at the high end of the distribution of such exposures. The associated mean IQ loss estimate is the average for this highly exposed subset and is not the average air-related IQ loss projected for the entire U.S. population of children. Uncertainties and limitations were recognized in the use

[19] The term "air-to-blood ratio" describes the increase in blood Pb (in µg/dL) estimated to be associated with each unit increase of air Pb (in µg/m^3). Ratios are presented in the form of 1:x, with the 1 representing air Pb (in µg/m^3) and x representing blood Pb (in µg/dL). Description of ratios as higher or lower refers to the values for x (*i.e.*, the change in blood Pb per unit of air Pb).

[20] The geometric mean blood Pb level for U.S. children aged 5 years and below, reported for NHANES in 2003–04 (the most recent years for which such an estimate was available at the time of the 2008 decision) was 1.8 µg/dL and the 5th and 95th percentiles were 0.7 µg/dL and 5.1 µg/dL, respectively (73 FR 67002).

of the framework and in the resultant estimates (73 FR 67000, November 12, 2008).

In considering the use of the evidence-based air-related IQ loss framework to inform his judgment as to the appropriate degree of public health protection that should be afforded by the NAAQS to provide requisite protection against risk of neurocognitive effects in sensitive populations, such as IQ loss in children, the Administrator recognized in the 2008 review that there were no commonly accepted guidelines or criteria within the public health community that would provide a clear basis for such a judgment. During the 2008 review, CASAC commented regarding the significance from a public health perspective of a 1–2 point IQ loss in the entire population of children and along with some commenters, emphasized that the NAAQS should prevent air-related IQ loss of a significant magnitude, such as on the order of 1–2 IQ points, in all but a small percentile of the population. Similarly, the Administrator stated that "ideally air-related (as well as other) exposures to environmental Pb would be reduced to the point that no IQ impact in children would occur" (73 FR 66998, November 12, 2008). The Administrator further recognized that, in the case of setting a NAAQS, he was required to make a judgment as to what degree of protection is requisite to protect public health with an adequate margin of safety (73 FR 66998, November 12, 2008). The NAAQS must be sufficient but not more stringent than necessary to achieve that result, and the Act does not require a zero-risk standard (73 FR 66998, November 12, 2008). The Administrator additionally recognized that the evidence-based air-related IQ loss framework did not provide estimates pertaining to the U.S. population of children as a whole. Rather, the framework provided estimates (with associated uncertainties and limitations) for the mean of a subset of that population, the subset of children assumed to be exposed to the level of the standard. As described in the final decision "[t]he framework in effect focuses on the sensitive subpopulation that is the group of children living near sources and more likely to be exposed at the level of the standard" (73 FR 67000, November 12, 2008). As further noted in the final decision (73 FR 67000, November 12, 2008):

> *EPA is unable to quantify the percentile of the U.S. population of children that corresponds to the mean of this sensitive subpopulation. Nor is EPA confident in its ability to develop quantified estimates of air-related IQ loss for higher percentiles than the mean of this subpopulation. EPA expects that the mean of this subpopulation represents a high, but not quantifiable, percentile of the U.S. population of children. As a result, EPA expects that a standard based on consideration of this framework would provide the same or greater protection from estimated air-related IQ loss for a high, albeit unquantifiable, percentage of the entire population of U.S. children.*

In reaching a judgment as to the appropriate degree of protection, the Administrator considered advice and recommendations from CASAC and public comments and recognized the uncertainties in the health effects evidence and related information as well as the role of, and context for, a selected air-related IQ loss in the application of the framework, as described above. Based on these considerations, the Administrator identified an air-related IQ loss of 2 points for use with the framework, as a tool for considering the evidence with regard to the level for the standard (73 FR 67005, November 12, 2008). In so doing, the Administrator was not determining that such an IQ decrement value was appropriate in other contexts (73 FR 67005, November 12, 2008). Given the various uncertainties associated with the framework and the scientific evidence base, and the focus of the framework on the sensitive subpopulation of children that are more highly exposed to air-related Pb, a standard level selected in this way, in combination with the selected averaging time and form, was expected to significantly reduce and limit for a high percentage of U.S. children the risk of experiencing an air-related IQ loss of that magnitude (73 FR 67005, November 12, 2008). At the standard level of 0.15 μg/m^3, with the combination of the generally central estimate of air-to-blood ratio of 1:7 and the median of the four C–R functions (−1.75 IQ point decrement per μg/dL blood Pb), the framework estimates of air-related IQ loss were below 2 IQ points (73 FR 67005, November 12, 2008, Table 4).

In reaching the decision in 2008 on a level for the revised standard, the Administrator also considered the results of the quantitative risk assessment to provide a useful perspective on risk from air-related Pb. In light of important uncertainties and limitations for purposes of evaluating potential standard levels, however, the Administrator placed less weight on the risk estimates than on the evidence-based assessment. Nevertheless, in recognition of the general comparability of quantitative risk estimates for the case studies considered most conceptually similar to the scenario represented by the evidence-based framework, he judged the quantitative risk estimates to be "roughly consistent with and generally supportive" of the evidence-based framework estimates (73 FR 67006, November 12, 2008).

Based on consideration of the entire body of evidence and information available in the review, as well as the recommendations of CASAC and public comments, the Administrator decided that a level for the primary Pb standard of 0.15 μg/m^3, in combination with the specified choice of indicator, averaging time and form, was requisite to protect public health, including the health of sensitive groups, with an adequate margin of safety (73 FR 67006, November 12, 2008). In reaching decisions on level as well as the other elements of the revised standard, the Administrator took note of the complexity associated with consideration of health effects caused by different ambient air concentrations of Pb and with uncertainties with regard to the relationships between air concentrations, exposures, and health effects. For example, selection of a maximum, not to be exceeded, form in conjunction with a rolling 3-month averaging time over a 3-year span was expected to have the effect that the at-risk population of children would be exposed below the standard most of the time (73 FR 67005, November 12, 2008). The Administrator additionally considered the provision of an adequate margin of safety in making decisions on each of the elements of the standard, including, for example "selection of TSP as the indicator and the rejection of the use of PM_{10} scaling factors; selection of a maximum, not to be exceeded form, in conjunction with a 3-month averaging time that employs a rolling average, with the requirement that each month in the 3-month period be weighted equally (rather than being averaged by individual data) and that a 3-year span be used for comparison to the standard; and the use of a range of inputs for the evidence-based framework, that includes a focus on higher air-to-blood ratios than the lowest ratio considered to be supportable, and steeper rather than shallower C–R functions, and the consideration of these inputs in selection of 0.15 μg/m^3 as the level of the standard" (73 FR 67007, November 12, 2008).

The Administrator additionally noted that a standard with this level would reduce the risk of a variety of health effects associated with exposure to Pb, including effects indicated in the epidemiological studies at lower blood Pb levels, particularly including neurological effects in children, and the potential for cardiovascular and renal effects in adults (73 FR 67006, November 12, 2008). The Administrator additionally considered higher and lower levels for the standard, concluding that a level of 0.15 μg/m^3 provided for a standard that was neither more or less stringent than necessary for this purpose, recognizing that the Act does not require that primary standards be set at a zero-risk level, but rather at a level that reduces risk sufficiently so as to protect public health with an adequate margin of safety (73 FR 67007, November 12, 2008). For example, the Administrator additionally considered potential public health protection provided by standard levels above 0.15 μg/m^3, which he concluded were insufficient to protect public health with an adequate margin of safety. The Administrator also noted that in light of all of the evidence, including the evidence-based framework, the degree of public health protection likely afforded by standard levels below 0.15 μg/m^3 would be greater than what is necessary to protect public safety with an adequate margin of safety.

The Administrator concluded, based on review of all of the evidence (including the evidence-based framework), that when taken as a whole the selected standard, including the indicator, averaging time, form, and level, would be "sufficient but not more than necessary to protect public health, including the health of sensitive subpopulations, with an adequate margin of safety" (73 FR 67007, November 12, 2008).

2. Approach for the Current Review

The approach in this review of the current primary standard takes into consideration the approach used in the last Pb NAAQS review, addressing key policy-relevant questions in light of currently available scientific and technical information. To evaluate whether it is appropriate to consider retaining the current primary Pb standard, or whether consideration of revision is appropriate, the EPA has adopted an approach in this review that builds upon the general approach used in the last review and reflects the broader body of evidence and information now available. As summarized above, the Administrator's decisions in the prior review were based on an integration of information on health effects associated with exposure to Pb with that on relationships between ambient air Pb and blood Pb; expert judgments on the adversity and public health significance of key health effects; and policy judgments as to when the standard is requisite to protect public health with an adequate margin of safety. These considerations were informed by air quality and related analyses, quantitative exposure and risk assessments, and qualitative assessment of impacts that could not be quantified.

Similarly in this review, as described in the PA, we draw on the current evidence and quantitative assessments of exposure pertaining to the public health risk of Pb in ambient air. In considering the scientific and technical information here as in the PA, we consider both the information available at the time of the last review and information newly available since the last review, including most particularly that which has been critically analyzed and characterized in the current ISA. We additionally consider the quantitative exposure/risk assessments from the last review that estimated Pb-related IQ decrements associated with different air quality conditions in simulated at-risk populations in multiple case studies (PA, section 3.4; 2007 REA). The evidence-based discussions presented below draw upon evidence from epidemiological studies and experimental animal studies evaluating health effects related to exposures to Pb, as discussed in the ISA. The exposure/risk-based discussions have drawn from the quantitative health risk analyses for Pb performed in the last Pb NAAQS review in light of the currently available evidence (PA, section 3.4; 2007 REA; REA Planning Document). Sections II.B through II.D below summarize the current health effects and exposure/risk information with a focus on the specific policy-relevant questions identified for these categories of information in the PA (PA, chapter 3).

B. Health Effects Information

1. Array of Effects

Lead has been demonstrated to exert a broad array of deleterious effects on multiple organ systems as described in the assessment of the evidence available in this review and consistent with conclusions of past CDs (ISA, section 1.6; 2006 CD, section 8.4.1). A sizeable number of studies on Pb health effects are newly available in this review and are critically assessed in the ISA as part of the full body of evidence. The newly available evidence reaffirms conclusions on the broad array of effects recognized for Pb in the last review (see ISA, section 1.10).[21] Consistent with those conclusions, in the context of pollutant exposures considered relevant to the Pb NAAQS review,[22] the ISA determines that causal relationships[23] exist for Pb with effects on the nervous system in children (cognitive function decrements and the group of externalizing behaviors comprising attention, impulsivity and hyperactivity), the hematological system (altered heme synthesis and decreased red blood cell survival and function), and the cardiovascular system (hypertension and coronary heart disease), and on reproduction and development (postnatal development and male reproductive function) (ISA, Table 1–2). Additionally, the ISA describes relationships between Pb and effects on the nervous system in adults, on immune system function and with cancer[24] as likely to be causal[25] (ISA, Table 1–2, sections 1.6.4 and 1.6.7).

In some categories of health effects, there is newly available evidence regarding some aspects of the effects described in the last review or that strengthens our conclusions regarding aspects of Pb toxicity on a particular

[21] Since the last Pb NAAQS review, the ISAs which have replaced CDs in documenting each review of the scientific evidence (or air quality criteria) employ a systematic framework for weighing the evidence and describing associated conclusions with regard to causality using established descriptors: "causal" relationship with relevant exposure, "likely" to be a causal relationship, evidence is "suggestive" of a causal relationship, "inadequate" evidence to infer a causal relationship, and "not likely" to be a causal relationship (ISA, Preamble).

[22] In drawing judgments regarding causality for the criteria air pollutants, the ISA places emphasis "on evidence of effects at doses (*e.g.*, blood Pb concentration) or exposures (*e.g.*, air concentrations) that are relevant to, or somewhat above, those currently experienced by the population. The extent to which studies of higher concentrations are considered varies . . . but generally includes those with doses or exposures in the range of one to two orders of magnitude above current or ambient conditions. Studies that use higher doses or exposures may also be considered . . . [t]hus, a causality determination is based on weight of evidence evaluation . . ., focusing on the evidence from exposures or doses generally ranging from current levels to one or two orders of magnitude above current levels" (ISA, pp. lx–lxi).

[23] In determining a causal relationship to exist for Pb with specific health effects, the EPA concludes that "[e]vidence is sufficient to conclude that there is a causal relationship with relevant pollutant exposures (*i.e.*, doses or exposures generally within one to two orders of magnitude of current levels)" (ISA, p. lxii).

[24] The EPA concludes that a causal relationship is likely to exist between Pb exposure and cancer, based primarily on consistent, strong evidence from experimental animal studies, but inconsistent epidemiological evidence (ISA, section 4.10.5). Lead has also been classified as a probable human carcinogen by the International Agency for Research on Cancer, based mainly on sufficient animal evidence, and as reasonably anticipated to be a human carcinogen by the U.S. National Toxicology Program (ISA, section 4.10).

[25] In determining that there is likely to be a causal relationship for Pb with specific health effects, the EPA has concluded that "[e]vidence is sufficient to conclude that a causal relationship is likely to exist with relevant pollutant exposures, but important uncertainties remain" (ISA, p. lxii).

physiological system. Among the nervous system effects of Pb, the newly available evidence is consistent with conclusions in the previous review which recognized that "[t]he neurotoxic effects of Pb exposure are among those most studied and most extensively documented among human population groups" (2006 CD, p. 8–25) and took note of the diversity of studies in which such effects of Pb exposure early in development (from fetal to postnatal childhood periods) have been observed (2006 CD, p. E–9). Nervous system effects that receive prominence in the current review, as in previous reviews, include those affecting cognitive function and behavior in children (ISA, section 4.3), with conclusions that are consistent with findings of the last review.

Across the broad array of Pb effects for systems and processes other than the nervous system, the evidence base has been augmented with additional epidemiological investigations in a number of areas, including developmental outcomes, such as puberty onset, and adult outcomes related to cardiovascular function, for which several large cohorts have been analyzed (ISA, Table 1–8 and sections 4.4 and 4.8). Conclusions on these other systems and processes are generally consistent with conclusions reached in the last review, while also extending our conclusions on some aspects of these effects (ISA, section 4.4 and Table 1–8).

Based on the extensive assessment of the full body of evidence available in this review, the major conclusions drawn by the ISA regarding health effects of Pb in children include the following (ISA, p. lxxxvii).

Multiple epidemiologic studies conducted in diverse populations of children consistently demonstrate the harmful effects of Pb exposure on cognitive function (as measured by IQ decrements, decreased academic performance and poorer performance on tests of executive function). . . . Evidence suggests that some Pb-related cognitive effects may be irreversible and that the neurodevelopmental effects of Pb exposure may persist into adulthood (Section 1.9.4). Epidemiologic studies also demonstrate that Pb exposure is associated with decreased attention, and increased impulsivity and hyperactivity in children (externalizing behaviors). This is supported by findings in animal studies demonstrating both analogous effects and biological plausibility at relevant exposure levels. Pb exposure can also exert harmful effects on blood cells and blood producing organs, and is likely to cause an increased risk of symptoms of depression and anxiety and withdrawn behavior (internalizing behaviors), decreases in auditory and motor function, asthma and allergy, as well as conduct disorders in children and young adults. There is some uncertainty about the Pb exposures contributing to the effects and blood Pb levels observed in epidemiologic studies; however, these uncertainties are greater in studies of older children and adults than in studies of young children (Section 1.9.5).

Based on the extensive assessment of the full body of evidence available in this review, the major conclusions drawn by the ISA regarding health effects of Pb in adults include the following (ISA, p. lxxxviii).

A large body of evidence from both epidemiologic studies of adults and experimental studies in animals demonstrates the effect of long-term Pb exposure on increased blood pressure (BP) and hypertension (Section 1.6.2). In addition to its effect on BP, Pb exposure can also lead to coronary heart disease and death from cardiovascular causes and is associated with cognitive function decrements, symptoms of depression and anxiety, and immune effects in adult humans. The extent to which the effects of Pb on the cardiovascular system are reversible is not well-characterized. Additionally, the frequency, timing, level, and duration of Pb exposure causing the effects observed in adults has not been pinpointed, and higher past exposures may contribute to the development of health effects measured later in life.

As in prior reviews of the Pb NAAQS, this review is focused on those effects most pertinent to ambient air Pb exposures. Given the reductions in ambient air Pb concentrations over the past decades, these effects are generally those associated with the lowest levels of Pb exposure that have been evaluated. Additionally, we recognize the limitations on our ability to draw conclusions regarding the exposure conditions contributing to the findings from epidemiological analyses of blood Pb levels in populations of older children and adults, particularly in light of their history of higher Pb exposures. Evidence available in future reviews may better inform this issue. In the last review, while recognizing the range of health effects in variously aged populations related to Pb exposure, we focused on the health effects for which the evidence was strongest with regard to relationships with the lowest exposure levels, neurocognitive effects in young children.

As is the case for studies of nervous system effects in children (discussed in more detail in section II.B.3 below), newly available studies of other effects in child and adult cohorts include cohorts with similar or somewhat lower mean blood Pb levels than in previously available studies. Categories of effects for which a causal relationship has been concluded in the ISA and for which there are a few newly available epidemiological studies indicating blood Pb associations with effects in study groups with somewhat lower blood Pb levels than previously available for these effects include effects on development (delayed puberty onset) and reproduction (male reproductive function) and on the cardiovascular system (hypertension) (ISA, sections 4.4 and 4.8; 2006 CD, sections 6.5 and 6.6). With regard to the former category, study groups in the newly available studies include groups composed of older children ranging up to age 18 years, for which there is increased uncertainty regarding historical exposures and their role in the observed effects.[26] An additional factor that handicaps our consideration of exposure levels associated with these findings is the appreciable uncertainty associated with our understanding of Pb biokinetics during this lifestage (ISA, sections 3.2, 3.3, and 4.8.6). The evidence newly available for Pb relationships with cardiovascular effects in adults include some studies with somewhat lower blood Pb levels than in the last review. The long exposure histories of these cohorts, as well as the generally higher Pb exposures of the past, complicate conclusions regarding exposure levels that may be eliciting observed effects (ISA, sections 4.4.2.4 and 4.4.7).[27] Accordingly, as discussed further below, we focus in this review, as in the last, on neurocognitive effects in young children.

2. Critical Periods of Exposure

As in the last review, we base our current understanding of health effects associated with different Pb exposure circumstances at various stages of life or in different populations on the full body of available evidence and primarily on epidemiological studies of health effects associated with population Pb biomarker levels (discussed further in section II.B.3 below). The epidemiological evidence is overwhelmingly composed of studies that rely on blood Pb for the exposure metric, with the remainder largely including a focus on bone Pb. Because these metrics reflect Pb in the body (*e.g.*, as compared to Pb exposure concentrations) and, in the case of blood Pb, reflect Pb available for distribution to target sites, they strengthen the

[26] Several of these studies involve NHANES III cohorts for which early childhood exposures were generally much higher than those common in the U.S. today (ISA, section 4.8.5).

[27] Studies from the late 1960s and 1970s suggest that adult blood Pb levels during that period ranged from roughly 13 to 16 μg/dL and from 15 to 30 μg/dL in children aged 6 and younger (ISA, section 4.4.1).

evidence base for purposes of drawing causal conclusions with regard to Pb generally. The complexity of Pb exposure pathways and internal dosimetry, however, tends to limit the extent to which these types of studies inform our more specific understanding of the Pb exposure circumstances (*e.g.*, timing within lifetime, duration, frequency and magnitude) eliciting the various effects.

As at the time of the last review (and discussed more fully in section II.B.3 below), assessment of the full evidence base, including evidence newly available in this review, demonstrates that Pb exposure prenatally and also in early childhood can contribute to neurocognitive impacts in childhood, with evidence also indicating the potential for effects persisting into adulthood (ISA, sections 1.9.4, 1.9.5, and 1.10). In addition to the observed associations of prenatal and childhood blood Pb with effects at various ages in childhood, there is also evidence of Pb-related cognitive function effects in non-occupationally exposed adults (ISA, section 4.3.11). This includes evidence of associations of such effects in adulthood with childhood blood Pb levels and in other cohorts, with concurrent (adult) blood Pb levels (ISA, sections 4.3.2.1, 4.3.2.7 and 4.3.11). As the studies finding associations of adult effects with childhood blood Pb levels did not examine adult blood Pb levels, the relative influence of adult Pb exposure cannot be ascertained, and a corresponding lack of early life exposure or biomarker measurements for the latter studies limits our ability to draw conclusions regarding specific Pb exposure circumstances eliciting the observed effects (4.3.11). Findings of stronger associations for adult neurocognitive effects with bone Pb, however, indicate the role of historical or cumulative exposures for those effects (ISA, section 4.3).

A critical aspect of much of the epidemiological evidence, particularly studies focused on adults (and older children) in the U.S. today, is the backdrop of generally declining environmental Pb exposure (from higher exposures during their younger years) that is common across many study populations (ISA, p. 4–2).[28] An additional factor complicating the interpretation of health effect associations with blood Pb measurements in older children and younger adults is the common behaviors of younger children (*e.g.*, hand-to-mouth contact) that generally contribute to relatively greater exposures earlier in life (ISA, sections 3.1.1, 4.2.1). Such exposure histories for adults and older children complicate our ability to draw conclusions regarding critical time periods and lifestages for Pb exposures eliciting the effects for which associations with Pb biomarkers have been observed in these populations (*e.g.*, ISA, section 1.9.6).[29] Thus, our confidence is greatest in the role of early childhood exposure in contributing to Pb-related neurocognitive effects that have been associated with blood Pb levels in young children. This is due, in part, to the relatively short exposure histories of young children (ISA, sections 1.9.4, 1.9.6 and 4.3.11).

Epidemiological analyses evaluating risk of neurocognitive impacts (*e.g.*, reduced IQ) associated with different blood Pb metrics in cohorts with differing exposure patterns (including those for which blood Pb levels at different ages were not highly correlated) also indicate associations with blood Pb measurements concurrent with full scale IQ (FSIQ) tests at ages of approximately 6–7 years. The analyses did not, however, conclusively demonstrate stronger findings for early (*e.g.*, age 2 years) or concurrent blood Pb (ISA, section 4.3.11).[30] The experimental animal evidence additionally indicates early life susceptibility (ISA, section 4.3.15 and p. 5–21). Thus, while uncertainties remain with regard to the role of Pb exposures during a particular age of life in eliciting nervous system effects, such as cognitive function decrements, the full evidence base continues to indicate prenatal and early childhood lifestages as periods of increased Pb-related risk (ISA, sections 4.3.11 and 4.3.15). We recognize increasing uncertainty, however, in our understanding of the relative impact on neurocognitive function of additional Pb exposure of children by school age or later that is associated with limitations of the currently available evidence, including epidemiological cohorts with generally similar temporal patterns of exposure.

As in the last review, there is also substantial evidence of other neurobehavioral effects in children, including effects on externalizing behaviors (reduced attention span, increased impulsivity, hyperactivity, and conduct disorders) and on internalizing behaviors. The evidence for many of these endpoints, as with neurocognitive effects, also includes associations of effects at various ages in childhood and for some effects, into adulthood, with blood Pb levels reflective of several different lifestages (*e.g.*, prenatal and several different ages in childhood) (ISA, sections 4.3.3 and 4.3.4). There is similar or relatively less extensive evidence to inform our understanding of such effects associated with specific time periods of exposure at specific lifestages than is the case for effects on cognitive function.

Across the range of Pb effects on physiological systems and processes other than the nervous system, the evidence base for blood pressure and hypertension is somewhat more informative with regard to the circumstances of Pb exposure eliciting the observed effects than are the evidence bases for many other effects. In the case of Pb-induced increases in blood pressure, the evidence indicates an importance of long-term exposure (ISA, sections 1.6.2 and 4.4.7.1). The greater uncertainties regarding the time, duration and magnitude of exposure contributing to these observed health effects complicate identification of sensitive lifestages and associated exposure patterns that might be compared with our understanding of the sensitivity of young children to neurocognitive impacts of Pb. Thus, while augmenting the evidence base on these additional endpoints, the newly available evidence does not lead us to identify a health endpoint expected to be more sensitive to Pb exposure than neurocognitive endpoints in children, leading us to continue to conclude that the appropriate primary focus for our review is on neurocognitive endpoints in children.

[28] The declines in Pb exposure concentrations occurring from the 1970s through the early 1990s (and experienced by middle aged and older adults of today), as indicated by NHANES blood Pb information, were particularly dramatic (ISA, section 3.4.1).

[29] The evidence from experimental animal studies can be informative with regard to key aspects of exposure circumstances in eliciting specific effects, thus informing our interpretation of epidemiological evidence. For example, the animal evidence base with regard to Pb effects on blood pressure demonstrates the etiologically-relevant role of long-term exposure (ISA, section 4.4.1). This finding then informs consideration of epidemiological studies of adult populations for whom historical exposures were likely more substantial than concurrent ones, suggesting that the observed effects may be related to the past exposure (ISA, section 4.4.1). For other health effects, the animal evidence base may or may not be informative in this manner.

[30] In the collective body of evidence of nervous system effects in children, it is difficult to distinguish exposure in later lifestages (*e.g.*, school age) and its associated risk from risks resulting from exposure in prenatal and early childhood (ISA, section 4.3.11). While early childhood is recognized as a time of increased susceptibility, a difficulty in identifying a discrete period of susceptibility from epidemiological studies has been that the period of peak exposure, reflected in peak blood Pb levels, is around 18–27 months when hand-to-mouth activity is at its maximum (ISA, section 3.4.1 and 5.2.1.1; 2006 CD, p. 6–60). The task is additionally complicated by the role of maternal exposure history in contributing Pb to the developing fetus (ISA, section 3.2.2.4.).

In summary, as in the last review, we continue to recognize a number of uncertainties regarding the circumstances of Pb exposure, including timing or lifestages, eliciting specific health effects. Consideration of the evidence newly available in this review has not appreciably changed our understanding on this topic. The relationship of long-term exposure to Pb with hypertension and increased blood pressure in adults is substantiated despite some uncertainty regarding the exposures circumstances (*e.g.*, magnitude and timing) contributing to blood Pb levels measured in epidemiological studies. Across the full evidence base, the effects for which our understanding of relevant exposure circumstances is greatest are neurocognitive effects in young children. Moreover, available evidence does not suggest a more sensitive endpoint. Thus, we continue to recognize and give particular attention to the role of Pb exposures relatively early in childhood in contributing to neurocognitive effects, some of which may persist into adulthood.

3. Nervous System Effects in Children

In considering the question of levels of Pb exposure at which health effects occur, we recognize, as discussed in sections II.B.1 and II.B.2 above, that the epidemiological evidence base for our consideration in this review, as in the past, includes substantial focus on internal biomarkers of exposure, such as blood Pb, with relatively less information specific to exposure levels, including those derived from air-related pathways. Given that blood and bone Pb are integrated markers of aggregate exposure across all sources and exposure pathways, our interpretation of studies relying on them is informed by what is known regarding the historical context and exposure circumstances of the study populations. For example, a critical aspect of much of the epidemiological evidence is the backdrop of generally declining Pb exposure over the past several decades (*e.g.*, ISA, sections 2.5 and 3.4.1; 2006 CD, section 3.4). Thus, as a generality, recent epidemiological studies of populations with similar characteristics as those studied in the past tend to involve lower overall Pb exposures and accordingly lower blood Pb levels. This has been of particular note in the evidence of blood Pb associations with nervous system effects, particularly impacts on cognitive function in children, for which we have seen associations with progressively lower childhood blood Pb levels across past reviews (ISA, section 4.3.12; 1986 CD; USEPA, 1990a; 2006 CD; 73 FR 66976, November 12, 2008).

The evidence currently available with regard to the magnitude of blood Pb levels associated with neurocognitive effects in children is generally consistent with that available in the review completed in 2008. Nervous system effects in children, specifically effects on cognitive function, continue to be the effects that are best substantiated as occurring at the lowest blood Pb concentrations (ISA, pp. lxxxvii–lxxxviii). Associations of blood Pb with effects on cognitive function measures in children have been reported in many studies across a range of childhood blood Pb levels, including study group (mean/median) levels ranging down to 2 µg/dL (*e.g.*, ISA, p. lxxxvii and section 4.3.2).[31]

Among the analyses of lowest study group blood Pb levels at the youngest ages are analyses available in the last review of Pb associations with neurocognitive function decrement in study groups with mean levels on the order of 3–4 µg/dL in children aged 24 months or ranging from 5 to 7 years (73 FR 66978–66979, November 12, 2008; ISA, sections 4.3.2.1 and 4.3.2.2; Bellinger and Needleman, 2003; Canfield et al., 2003; Lanphear et al., 2005; Tellez-Rojo et al., 2006; Bellinger, 2008; Canfield, 2008; Tellez-Rojo, 2008; Kirrane and Patel, 2014).[32] Newly available in this review are two studies reporting association of blood Pb levels prior to 3 years of age with academic performance on standardized tests in primary school; mean blood Pb levels in these studies were 4.2 and 4.8 µg/dL (ISA, section 4.3.2.5; Chandramouli et al., 2009; Miranda et al., 2009). One of these two studies, which represented integer blood Pb levels as categorical variables, indicated a small effect on end-of-grade reading score of blood Pb levels as low as 2 µg/dL, after adjustment for age of measurement, race, sex, enrollment in free or reduced lunch program, parental education, and school type (Miranda et al., 2009).

In a newly available study of blood Pb levels at primary school age, a significant association of blood Pb in children aged 8–11 years and concurrently measured FSIQ was reported for a cross-sectional cohort in Korea with a mean blood Pb level of 1.7 µg/dL and range of 0.43–4.91 µg/dL (Kim et al., 2009).[33] In considering the blood Pb levels in this study, we note that blood Pb levels in children aged 8–11 are generally lower than those in pre-school children, for reasons related to behavioral and other factors (ISA, sections 3.3.5, 3.4.1 and 5.2.1.1). It is likely that the blood Pb levels of this study group at earlier ages, *e.g.*, prior to school entry, were higher and the available information does not provide a basis to judge whether the blood Pb levels in this study represent lower exposure levels than those experienced by the younger study groups. In still older children, a large cross-sectional investigation of blood Pb association with effects on memory and learning that was available in the last review was focused on children aged 6–16 years, born during 1972–1988, with a mean blood Pb of 1.9 µg/dL (Lanphear et al., 2000). A study newly available in this review, focused on a subset of the earlier study cohort (ages 12–16, born during 1975–1982), also reports a significant negative association of blood Pb with learning and memory test results with mean blood Pb levels of approximately 2 µg/dL (ISA, section 4.3.2.3; Lanphear et al., 2000; Krieg et al., 2010). In considering these study findings with regard to the question of exposure levels eliciting effects, we recognize, however, that blood Pb levels are, in general, lower among teenagers than young children and also that, for these subjects specifically, the magnitude of blood Pb levels during the earlier childhood (*e.g.*, pre-school ages) was much higher. For example, the mean blood Pb levels for the 1–5 year old age group in the NHANES 1976–80 sample was 15 µg/dL, declining to 3.6 µg/dL in the NHANES 1988–1991 sample (Pirkle et al., 1994; ISA, section 3.4.1). In summary, the available information is for population groups of ages for which the NHANES samples indicate exposure levels were higher earlier in childhood. Thus, in light of the NHANES information, although the

[31] The value of 2 µg/dL refers to the regression analysis of blood Pb and end-of-grade test scores, in which blood Pb was represented by categories for integer values of blood Pb from 1 µg/dL to 9 and >10 µg/dL from large statewide database. A significant effect estimate was reported for test scores with all blood Pb categories in comparison to the reference category (1 µg/dL), which included results at and below the limit of detection. Mean levels are not provided for any of the categories (Miranda et al., 2009).

[32] The tests for cognitive function in these studies include age-appropriate Wechsler intelligence tests (Lanphear et al., 2005; Bellinger and Needleman, 2003), the Stanford-Binet intelligence test (Canfield et al., 2003), and the Bayley Scales of Infant Development (Tellez-Rojo et al., 2006). The Wechsler and Stanford-Binet tests are widely used to assess neurocognitive function in children and adults. These tests, however, are not appropriate for children under age 3. For such children, studies generally use the age-appropriate Bayley Scales of Infant Development as a measure of cognitive development.

[33] Limitations of this study included a lack of consideration of potential confounding by parental caregiving quality or IQ (ISA, Table 4–3).

blood Pb levels in the studies of cognitive effects in older child population groups are lower (at the time of the study) than the younger child study levels, the studies of older children do not provide a basis for concluding a role for lower Pb exposure levels than those experienced by the younger study groups.

With regard to other nervous system effects in children, the evidence base at lower blood Pb levels is somewhat extended since the last review with regard to the evidence on Pb and effects on externalizing behaviors, such as attention, impulsivity, hyperactivity and conduct disorders (ISA, section 4.3.3 and Table 4–17). Several newly available studies investigating the role of blood Pb levels in older children (primary school age and older) have reported significant associations for these effects with concurrent blood Pb levels, with mean levels generally on the order of 5 µg/dL or higher (ISA, section 4.3.3). One exception is the newly available cross-sectional, categorical analysis of the NHANES 2001–2004 sample of children aged 8–15 years, which found higher prevalence of conduct disorder in the subgroup with concurrent blood Pb levels of 0.8–1.0 µg/dL as compared to the <0.8 µg/dL group (ISA, section 4.3.4 and Table 4–12). As noted above, we recognize that many of these children, born between 1986 and 1996, are likely to have had much higher Pb exposures (and associated blood Pb levels) in their earlier years than those commonly experienced by young children today, thus making this study relatively uninformative with regard to evidence of effects associated with lower exposure levels than provided by evidence previously available.

In summary, our conclusions regarding exposure levels at which Pb health effects occur, particularly with regard to such levels that might be common in the U.S. today, are complicated now, as in the last review, by several factors. These factors include the scarcity of information in epidemiological studies on cohort exposure histories, as well as by the backdrop of higher past exposure levels which frame the history of most, if not all, older study cohorts. Recognizing the complexity, as well as the potential role of higher exposure levels in the past, we continue to focus our consideration of this question on the evidence of effects in young children for which our understanding of exposure history is less uncertain.[34] Within this evidence base, we recognize the lowest study group blood Pb levels to be associated with effects on cognitive function measures, indicating that to be the most sensitive endpoint. As described above, the evidence available in this review is generally consistent with that available in the last review with regard to blood Pb levels at which such effects had been reported (ISA, section 4.3.2; 2006 CD, section 8.4.2.1; 73 FR 66976–66979, November 12, 2008). As blood Pb levels are a reflection of exposure history, particularly in early childhood (ISA, section 3.3.2), we conclude, by extension, that the currently available evidence does not indicate Pb effects at exposure levels appreciably lower than recognized in the last review.

We additionally note that, as in the last review, a threshold blood Pb level with which nervous system effects, and specifically cognitive effects, occur in young children cannot be discerned from the currently available studies (ISA, sections 1.9.3 and 4.3.12). Epidemiological analyses have reported blood Pb associations with cognitive effects (FSIQ or BSID MDI[35]) for young child population subgroups (age 5 years or younger) with individual blood Pb measurements as low as approximately 1 µg/dL and mean concentrations as low as 2.9 to 3.8 µg/dL (ISA, section 4.3.12; Bellinger and Needleman, 2003; Bellinger, 2008; Canfield et al., 2003; Canfield, 2008; Tellez-Rojo et al., 2006; Tellez-Rojo, 2008). As concluded in the ISA, however, "the current evidence does not preclude the possibility of a threshold for neurodevelopmental effects in children existing with lower blood levels than those currently examined" (ISA, section 4.3.13).

Important uncertainties associated with the evidence of effects at low exposure levels are similar to those recognized in the last review, including the shape of the concentration-response relationship for effects on neurocognitive function at low blood Pb levels in today's young children. Also of note is our interpretation of associations between blood Pb levels and effects in epidemiological studies, with which we recognize uncertainty with regard to the specific exposure circumstances (timing, duration, magnitude and frequency) that have elicited the observed effects, as well as uncertainties in relating ambient air concentrations (and associated air-related exposures) to blood Pb levels in early childhood, as discussed in section II.B.2 above. We additionally recognize uncertainties associated with conclusions drawn with regard to the nature of the epidemiological associations with blood Pb (*e.g.*, ISA, section 4.3.13), but note that, based on consideration of the full body of evidence for neurocognitive effects, the EPA has determined a causal relationship to exist between relevant blood Pb levels and neurocognitive impacts in children (ISA, section 4.3.15.1).

Based primarily on studies of FSIQ, the assessment of the currently available studies, as was the case in the last review, continues to recognize a nonlinear relationship between blood Pb and effects on cognitive function, with a greater incremental effect (greater slope) at lower relative to higher blood Pb levels within the range thus far studied, extending from well above 10 µg/dL to below 5 µg/dL (ISA, section 4.3.12). This was supported by the evidence available in the last review, including the analysis of the large pooled international dataset comprised of blood Pb measurements and IQ test results from seven prospective cohorts (Lanphear et al., 2005; Rothenberg and Rothenberg, 2005; ISA, section 4.3.12). The blood Pb measurements in this pooled dataset that were concurrent with the IQ tests ranged from 2.5 µg/dL to 33.2 µg/dL. The study by Lanphear et al. (2005) additionally presented analyses that stratified the dataset based on peak blood Pb levels (*e.g.*, with cutpoints of 7.5 µg/dL and 10 µg/dL peak blood Pb) and found that the coefficients from linear models of the association for IQ with concurrent blood Pb were higher in the lower peak blood Pb level subsets than the higher groups (ISA, section 4.3.12; Lanphear et al., 2005).

We note that since the completion of the ISA, two errors have been identified with the pooled dataset analyzed by Lanphear et al. (2005) (Kirrane and Patel, 2014). A recent publication and the EPA have separately recalculated the statistics and mathematical model parameters of Lanphear et al. (2005) using the corrected pooled dataset (see Kirrane and Patel, 2014). While the magnitude of the loglinear and linear regression coefficients are modified slightly based on the corrections, the conclusions drawn from these coefficients, including the finding of a steeper slope at lower (as compared to

[34] In focusing on effects associated with blood Pb levels in early childhood, however, we additionally recognize the evidence across categories of effects that relate to blood Pb levels in older child study groups (for which early childhood exposure may have had an influence) which provides additional support to an emphasis on nervous system effects (ISA, sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8).

[35] The Bayley Scales of Infant Development, Mental Development Index is a well-standardized and widely used assessment measure of infant cognitive development. Scores earlier than 24 months are not necessarily strongly correlated with later FSIQ scores in children with normal development (ISA, section 4.3.15.1).

higher) blood Pb concentrations, are not affected (Kirrane and Patel, 2014).

In other publications, stratified analyses of several individual cohorts also observed higher coefficients for blood Pb relationships with measures of neurocognitive function in lower as compared to higher blood Pb subgroups (ISA, section 4.3.12; Canfield et al., 2003; Bellinger and Needleman, 2003; Kordas et al., 2006; Tellez-Rojo et al., 2006). Of these subgroup analyses, those involving the lowest mean blood Pb levels and closest to the current mean for U.S. preschool children are listed in Table 1 (drawn from Table 3 of the 2008 final rulemaking notice [73 FR 67003, November 12, 2008], and Kirrane and Patel, 2014).[36] These analyses were important inputs for the evidence-based, air-related IQ loss framework whicb informed decisions on a revised standard in the last review (73 FR 67005, November 12, 2008), discussed in section II.A.1 above. As the framework focused on the median of the four slopes in Table 1, the change to the one from Lanphear et al. (2005) based on the recent recalculation described above has no impact on conclusions drawn from the framework.

TABLE 1—SUMMARY OF QUANTITATIVE RELATIONSHIPS OF IQ AND BLOOD PB FOR ANALYSES WITH BLOOD PB LEVELS CLOSEST TO THOSE OF YOUNG CHILDREN IN THE U.S. TODAY

Blood Pb levels (µg/dL)		Study/analysis	Average linear slope[A] (IQ[B] points per µg/dL)
Geometric mean	Range (min–max)		
2.9	0.8–4.9	Tellez-Rojo et al. (2006)[B], subgroup w. concurrent blood Pb <5 µg/dL.	−1.71
3.3	0.9–7.4	Lanphear et al. (2006)[C], subgroup w. peak blood Pb <7.5 µg/dL.	−2.53
3.32	0.5–8.4	Canfield et al. (2003)[C D], subgroup w. peak blood Pb <10 µg/dL.	−1.79
3.8	1–9.3	Bellinger and Needleman (2003)[C E], subgroup w. peak blood Pb <10 µg/dL.	−1.56
Median value			−1.75

A—Average linear slope estimates here are generally for relationship with IQ assessed concurrently with blood Pb measurement. As exceptions, Bellinger & Needleman (2003) slope is relationship for 10 year old IQ with blood Pb levels at 24 months, and the data for Boston cohort included in Lanphear et al. (2005) slope are relationship for 10 year old IQ with blood Pb levels at 5 years.

B—The slope for Tellez-Rojo et al. (2006) is for BSID (MDI), a measure of cognitive development appropriate to study population age (24-mos). The blood Pb levels for this subgroup are from Tellez-Rojo (2008).

C—The Lanphear et al. (2005) pooled international study also includes blood Pb data from the Rochester and Boston cohorts, although for different ages (6 and 5 years, respectively) than the ages analyzed in Canfield et al. (2003) and Bellinger and Needleman (2003). Thus, the ages at the blood Pb measurements used in derivation of the linear slope for the Lanphear et al. (2005) subgroup shown here are 5 to 7 years. The blood Pb levels and coefficient presented here for Lanphear et al. (2005) study group reflect the recalculation using the corrected pooled dataset (Kirrane and Patel, 2014).

D—Blood Pb levels for this subgroup are from Canfield (2008).

E—Blood Pb levels for this subgroup are from Bellinger (2008).

Several studies newly available in the current review have, in all but one instance, also found a nonlinear blood Pb-cognitive function relationship in nonparametric regression analyses of the cohort blood Pb levels analyzed (ISA, section 4.3.12). These studies, however, used statistical approaches that did not produce quantitative results for each blood Pb group (ISA, section 4.3.12). Thus, newly available studies have not extended the range of observation for quantitative estimates of this relationship to lower blood Pb levels than those of the previous review. The ISA further notes that the potential for nonlinearity has not been examined in detail within a lower, narrower range of blood Pb levels than those of the full cohorts thus far studied in the currently available evidence base (ISA, section 4.3.12). Such an observation in the last review supported the consideration of linear slopes with regard to blood Pb levels at and below those represented in Table 1. In summary, the newly available evidence does not substantively alter our understanding of the C–R relationship (including quantitative aspects) for neurocognitive impact, such as IQ with blood Pb in young children.

4. At-Risk Populations

In this section, we use the term "at-risk populations"[37] to recognize populations that bave a greater likelibood of experiencing Pb-related health effects, *i.e.*, groups witb characteristics that contribute to an increased risk of Pb-related health effects. These populations are also sometimes referred to as sensitive groups (as in section I.A above). In identifying factors that increase risk of Pb-related health effects, the EPA has considered evidence regarding factors contributing to increased susceptibility, generally including physiological or intrinsic factors contributing to a greater response for the same exposure, and those contributing to increased exposure, including that resulting from behavior leading to increased contact with contaminated media (ISA, Chapter 5). Physiological risk factors include both conditions contributing to a group's increased risk of effects at a given blood Pb level, and those that contribute to blood Pb levels higher than those otherwise associated with a

[36] One of these four is from the analysis of the lowest blood Pb subset of the pooled international study by Lanphear et al. (2005). The nonlinear model developed from the full pooled dataset is the basis of the C–R functions used in the 2007 REA, in which risk was estimated over a large range of blood Pb levels (PA, section 3.4.3.3). Given the narrower focus of the evidence-based framework on IQ response at the end of studied blood Pb levels (closer to U.S. mean level), the C–R functions in Table 1 are from linear analyses (each from separate publications) for the study group subsets with blood Pb levels closest to mean for children in the U.S. today.

[37] In the context of "at-risk populations," the term "population" refers to persons having one or more qualities or characteristics including, for example, a specific pre-existing illness or a specific age or lifestage, with lifestage referring to a distinguishable time frame in an individual's life characterized by unique and relatively stable behavioral and/or physiological characteristics that are associated with development and growth.

given Pb exposure (*e.g.*, ISA, sections 5.3 and 5.1, respectively).

The information newly available in this review has not substantially altered our previous understanding of at-risk populations for Pb in ambient air. As in the last review, the factor most prominently recognized to contribute to increased risk of Pb effects is childhood (ISA, section 1.9.6). As noted in section II.B.2 above, although the specific ages or lifestages of greatest susceptibility[38] or risk have not been established (*e.g.*, ISA, section 4.3.11), the at-risk status of young children to the neurodevelopmental effects of Pb is well recognized (*e.g.*, ISA, sections 1.9.6, 4.3, 5.2.1, 5.3.1, and 5.4). The evidence indicates that prenatal blood Pb levels are associated with nervous system effects, including mental development in very young children and can also be associated with cognitive decrements in older cbildren (ISA, section 4.3). Additionally, the coincidence during early childhood of behaviors that increase exposure, such as hand-to-mouth contact by which children transfer Pb in settled particles to their mouths, and the development of the nervous system also contributes increased risk during this time (ISA, sections 3.7.1, 4.3.2.6, 5.2.1.1, 5.3.1.1 and 5.4). Collectively, however, the evidence indicates both the susceptibility of the developing fetus and early postnatal years, as well as the potential for continued susceptibility through childhood as the human centrel nervous system continues to mature and be vulnerable to neurotoxicants (ISA, sections 1.9.5 and 4.3.15; 2006 CD, section 6.2.12). As discussed in section II.B.2 above, while uncertainties remain with regard to the role of Pb exposures during a particular age of life in eliciting nervous system effects, such as cognitive function decrements, the full evidenca bese continues to indicate prenatal and early childhood lifestages as periods of increased Pb-related risk (ISA, sections 4.3.11 and 4.3.15).

Several physiological factors increase the risk of Pb-related health effects by contributing to increased blood Pb levels over those otherwise associated with a given Pb exposure (ISA, sections 3.2, 3.3 and 5.1). These include nutritional status, which plays a role in Pb absorption from the gastrointestinal tract (ISA, sections 3.2.1.2, 5.1, 5.3.10 and 5.4). For example, diets deficient in iron, calcium or zinc can contribute to increased Pb absorption and associated higher blood Pb levels (ISA, sections 3.2.1.2, and 5.1). Evidence is suggestive of some genetic characteristics as potential risk factors, such as presence of the δ-aminolevulinic acid dehydratase-2 (ALAD–2) allele which has been indicated to increase blood Pb levels or Pb-related risk of health effects in some studies (ISA, sections 3.3.2 and 5.1).

Risk factors based on increased exposure include spending time in proximity to sources of Ph to ambient air or other environmental media (*e.g.*, large active metals industries or locations of historical Pb contamination) (ISA, sections 1.9.6, 3.7.1, 5.2.5 and 5.4). Residential factors associated with other sources of Pb exposure (*e.g.*, leaded paint or plumbing with Ph pipes or solder) are another exposure-related risk factor (ISA, sections 3.7.1, 5.2.6 and 5.4). Additionally, some races or ethnicities have been associated with higher blood Pb levels, with differential exposure indicated in some cases as the cause (ISA, sections 5.2.3 and 5.4). Lower socioeconomic status (SES) has been associated with higher Pb exposure and higher blood Pb concentration, leading the ISA to conclude the evidence is suggestive for low SES as a risk factor (ISA, sections 5.3.16, 5.2.4 and 5.4). Although the differences in blood Pb levels between children of lower and bigher income levels (as well as among some races or ethnicities) have lessened, blood Pb levels continue to be higher among lower-income children indicating higher exposure and/or greater influence of factors independent of exposure, sucb as nutritional factors (ISA, sections 1.9.6, 5.2.1.1 and 5.4).

In considering risk factors associated with increased Pb exposure or increased blood Pb levels, we note that the currently available evidence continues to support a nonlinear relationship between neurocognitive effects and blood Pb that indicates incrementally greater impacts at lower as compared to higher blood Pb levels (ISA, section 4.3.12), as described in section II.B.3 above. An important implication of this finding is that while children with higher blood Ph levels are at greater risk of Pb-related effects than children with lower blood Pb levels, on an incremental basis (*e.g.*, par µg/dL), the risk is greater for children at lower blood Pb levels. This was given particular attention in the last review of the Pb NAAQS, in which tbe standard was revised with consideration of the incremental impact of air-related Pb on young children in the U.S. and the recognition of greater impact for those children with lower ahsolute blood Pb levels (73 FR 67002, November 12, 2008). Such consideration included a focus on those C–R studies involving the lowest hlood Pb levels, as described in section II.A.1 above.

In summary, the information newly available in this review has not appreciahly altered our understanding of human populations that are particularly sensitive to Pb exposures. In the current review, as at the time of the last review of the Pb NAAQS, we recognize young children as an important at-risk population, with sensitivity extending to prenatal exposures and into childhood development. Additional risk factors for increased blood Pb levels include deficiencies in dietary minerals (iron, calcium and zinc), some racial or ethnic backgrounds,[39] and spending time in proximity to environmental sources of Pb or residing in older houses with Pb exposure related to paint or plumhing.[40] The currently available evidence continues to additionally suggest a potential for increased risk associated with several other factors, including older adulthood,[41] pre-existing disease

[38] As noted in the ISA, "in most instances, 'susceptibility' refers to biological or intrinsic factors (*e.g.*, age and sex) while 'vulnerability' refers to nonbiological or extrinsic factors (*e.g.*, socioeconomic status [SES])" and the terms "at-risk" and "sensitive" populations have in various instances been used to encompass these concepts more generally (ISA, p. 5–1). In providing detail regarding factors contributing to an "at-risk" status in this section, we have used the other terms in particular instances, with our usage consistent with these common definitions.

[39] The ISA concludes that studies of race/ethnicity provide adequate evidence that race/ethnicity is an at-risk factor based on the higher exposure observed among non-white populations and some modification observed in studies of associations between Pb levels and some health effects, such as hypertension (ISA, section 6.4).

[40] The evidence for SES continues to indicate increased blood Pb levels in lower income children, although its role with regard to an increased health risk for the same blood Pb level is unclear and its role generally with regard to Pb-related risk is somewhat complicated. SES often serves as a marker term for one or a combination of unspecified or unknown environmental or behavioral variables. Further, it is independently associated with an adverse impact on neurocognitive development, and a few studies have examined SES as a potential modifier of the association of childhood Pb exposure with cognitive function with inconsistent findings regarding low SES as a potential risk factor. The ISA concludes the evidence for SES as a Pb risk factor is suggestive, hased on the greater exposures or hlood Pb levels in some low SES groups (ISA, section 5.4).

[41] The ISA identifies older adulthood as a lifestage of potentially greater risk of Pb-related health effects based primarily on the evidence of increases in blood Pb levels during this lifestage (ISA, sections 5.2.1.2, 5.3.1.2, and 5.4), as well as observed associations of some cardiovascular and nervous system effects with bone and blood Pb in older populations, with biological plausibility for the role of Pb provided by experimental animal studies (ISA, sections 4.3.5, 4.3.7 and 4.4). Exposure histories of older adult study populations, which included younger years during the time of leaded gasoline usage and other sources of Pb exposures which were more prevalent in the past than today, are likely contributors to their blood Pb levels (ISA, pp. lx–lxi; Figure 2–1 and sections 2.5.2, 3.3.5 and 5.2.1.2).

(*e.g.*, hypertension), variants for certain genes and increased stress (ISA, section 5.3.4). As discussed above, we recognize the sensitivity of the prenatal period and several lifestages of childhood to an array of neurocognitive and behavioral effects, and we particularly recognize young children as an important at-risk population in light of current environmental exposure levels. Age or lifestage was used to distinguish potential groups on which to focus in the last review in recognition of its role in exposure and susceptibility, and young children were the focus of the REA in consideration of the health effects evidence regarding endpoints of greatest public health concern and in recognition of effects on the developing nervous system as a sentinel endpoint for public health impacts of Pb. This identification continues to be supported by the evidence available in the current review.

5. Potential Impacts on Public Health

There are several potential public health impacts associated with Pb exposure in the current U.S. population. In recognition of effects causally related to blood Pb levels somewhat near those most recently reported for today's population and for which the weight of the evidence is greatest, the potential public health impacts most prominently recognized in the ISA are population IQ impacts associated with childhood Pb exposure and prevalence of cardiovascular effects in adults (ISA, section 1.9.1). With regard to the latter category, as discussed above, the full body of evidence indicates a role of long-term cumulative exposure, with uncertainty regarding the specific exposure circumstances contributing to the effects in the epidemiological studies of adult populations, for whom historical Pb exposures were likely much higher than exposures that commonly occur today (ISA, section 4.4). There is less uncertainty regarding the exposure patterns contributing to the blood Pb levels reported in studies of younger populations (ISA, sections 1.9.4 and 1.10). Accordingly, the discussion of public health implications relevant to this review is focused predominantly on nervous system effects, including IQ decrements, in children.

The magnitude of a public health impact is dependent upon the type or severity of the effect, as well as the size of populations affected. Intelligence quotient is a well-established, widely recognized and rigorously standardized measure of neurocognitive function, as well as a global measure reflecting the integration of numerous processes (ISA, section 4.3.2; 2006 CD, sections 6.2.2 and 8.4.2). Examples of other measures of cognitive function negatively associated with Pb exposure include other measures of intelligence and cognitive development and measures of other cognitive abilities, such as learning, memory, and executive functions, as well as academic performance and achievement (ISA, section 4.3.2). Although some neurocognitive effects of Pb in children may be transient, some may persist into adulthood (ISA, section 1.9.5).[42] We also note that deficits in neurodevelopment early in life may have lifetime consequences as "[n]eurodevelopmental deficits measured in childhood may set affected children on trajectories more prone toward lower educational attainment and financial well-being" (ISA, section 4.3.14). Thus, population groups for which neurodevelopment is affected by Pb exposure in early childhood are at risk of related impacts on their success later in life. Further, in considering population risk, the ISA notes that "[s]mall shifts in the population mean IQ can be highly significant from a public health perspective" (ISA, p. xciii). For example, if Pb-related decrements are manifested uniformly across the range of IQ scores in a population, "a small shift in the population mean IQ may be significant from a public health perspective because such a shift could yield a larger proportion of individuals functioning in the low range of the IQ distribution, which is associated with increased risk of educational, vocational, and social failure" as well as a decrease in the proportion with high IQ scores (ISA, section 1.9.1).

As summarized above, young children are the at-risk population that may be most at risk of health effects associated with exposure to Pb and children at greatest risk from *air-related* Pb are those children with highest air-related Pb exposure which we consider to be those living in areas of higher ambient air Pb concentrations. To inform our understanding of the extent of this population potentially at risk from air-related Pb, the PA includes two analyses. The first analysis is based on consideration of the available air Pb monitoring information. As the air quality data set available for the first analysis may not be inclusive of all of the newly sited monitors (as discussed in section 2.2.1 of the PA) and there may be other areas with elevated Pb concentrations, a second analysis was performed in consideration of emissions estimates from the National Emissions Inventory (NEI), although with recognition of uncertainties associated with inferences drawn from such estimates with regard to ambient air Pb concentrations and exposures (PA, pp. 3–36 to 3–38).[43]

The first PA analysis indicates that approximately one hundredth of one percent of the full population of children aged 5 or under in the U.S. reside within 0.5 km of monitors exceeding or within 10 percent of the level of the current standard (PA, section 2.2.2.2, pp. 3–36 to 3–37, 4–25 and Table 3–4). In the second analysis, the size of young child populations residing in areas near large Pb sources was approximately four hundredths of one percent of the full U.S. population of children aged 5 years or younger (PA, pp. 3–37 to 3–38, 4–25). The PA recognized uncertainties and potential limitations associated with the use of the emissions estimates in the second analysis to make inferences regarding ambient air Pb exposures, uncertainties both with regard to the accuracy of such estimates and also with regard to the role of specific source characteristics and meteorology, not explicitly considered here, in influencing ambient air Pb concentrations and contributing to substantial variation in air Pb concentrations at source locations (*e.g.*, PA, Figure 2–11). Accordingly, while the second analysis is considered informative with regard to the potential prevalence of airborne Pb emissions and potential exposure of human populations, it is limited with regard to its ability to identify populations living in areas of elevated ambient air Pb concentrations. The PA interprets the two analyses together to indicate that well below one tenth of one percent of the full population of children aged 5 years or younger in the U.S. today live in areas with air Pb concentrations near or above the current standard, with the current monitoring data indicating the size of this population to be approximately one hundredth of a percent of the full population of children aged 5 or younger (PA, pp. 3–36 to 3–38, 4–25, 4–32).

[42] The ISA states that the "persistence of effects appears to depend on the duration and window of exposure as well as other factors that may affect an individual's ability to recover from an insult," with some evidence of greater recovery in children reared in households with more optimal caregiving characteristics and low concurrent blood Pb levels (ISA, p. 1–77; Bellinger et al., 1990).

[43] Such uncertainties include those with regard to specific source characteristics and meteorology, not explicitly considered in the analysis. In light of such uncertainties, the PA interprets the emissions-based analysis to provide a bounding estimate below which the true value is expected to fall (PA, p. 3–37).

C. Blood Lead as a Biomarker of Exposure and Relationships With Air Lead

Blood Pb is well established as a biomarker of Pb exposure and of internal dose, with relationships between air Pb concentrations and blood Pb concentrations informing consideration of the NAAQS for Pb since its initial establishment in 1978. Lead associated with inhaled particles may, depending on particle size and Pb solubility, be absorbed into the systemic circulation or transported with particles to the gastrointestinal tract (ISA, section 3.2.1.1), where its absorption is influenced by a range of factors (ISA, section 3.2.1.2). Lead in the blood stream is quickly distributed throughout the body (*e.g.*, within days), available for exchange with the soft and skeletal tissues, the latter of which serves as the largest storage compartment (ISA, section 3.2.2.2). Given the association with exposure and the relative ease of collection, blood Pb levels are extensively used as an index or biomarker of exposure by national and international health agencies, as well as in epidemiological and toxicological studies of Pb health effects and dose-response relationships (ISA, sections 3.3.2, 3.4.1, 4.3, 4.4, 4.5, 4.6, 4.7, and 4.8). While bone Pb measurements are also used in epidemiological studies as an indicator of cumulative Pb exposure, blood Pb measurements remain the predominant, well-established and well-characterized exposure approach.

Since 1976, the CDC has been monitoring blood Pb levels nationally through the NHANES. This survey has documented the dramatic decline in mean blood Pb levels in all ages of the U.S. population that has occurred since the 1970s (PA, Figure 3–1), and that coincides with actions on leaded fuels, leaded paint, Pb in food packaging, and Pb-containing plumbing materials that have reduced Pb exposure in the U.S. (ISA, section 3.4.1; Pirkle et al., 1994; Schwemberger et al., 2005). This decline has continued over the more recent past. For example, the 2009–2010 geometric mean blood Pb level in U.S. children aged 1–5 years is 1.17 µg/dL, as compared to 1.51 µg/dL in 2007–2008 (ISA, section 3.4.1) and 1.8 µg/dL in 2003–2004, the most recent data available at the time of the last review (73 FR 67002, November 12, 2008). Somewhat less dramatic declines have been reported in the upper tails of the distribution and in different groups with higher blood Pb levels than the general child population (ISA, Figures 3–17 and 3–19).

The blood Pb concentration in childhood (particularly early childhood) can more quickly (than in adulthood) reflect changes in total body burden (associated with the shorter exposure history) and can also reflect changes in recent exposures (ISA, section 3.3.5). The relationship of children's blood Pb to recent exposure may reflect their labile bone pool, with their rapid bone turnover in response to rapid childhood growth rates (ISA, section 3.3.5). The relatively smaller skeletal compartment of Pb in children (particularly very young children) compared to adults is subject to more rapid turnover. The distribution of Pb in the body is dynamic throughout life, with Pb in the body being exchanged between blood and bone and between blood and soft tissues (ISA, sections 3.3.5 and 3.2.2; 2006 CD, section 4.3.2). The rates of these exchanges vary with age, exposure and various physiological variables. For example, resorption of bone, which results in the mobilization of Pb from bone into the blood, is a somewhat rapid and ongoing process during childhood and a more gradual process in later adulthood (ISA, sections 3.2.2.2, 3.3.5 and 3.7.2; PA, pp. 3–2 to 3–3).

Lead in ambient air contributes to Pb in blood by multiple exposure pathways by both inhalation and ingestion exposure routes (ISA, section 3.1.1). Multiple studies have demonstrated young children's blood Pb levels to reflect Pb exposures, including exposures to Pb in surface dust (*e.g.*, Lanphear and Roghmann, 1997; Lanphear et al., 1998). These and studies of child populations near sources of air Pb emissions, such as metal smelters, have further demonstrated the effect of airborne Pb on interior dust and on blood Pb (ISA, sections 3.4.1, 3.5.1 and 3.5.3; Hilts, 2003; Gulson et al., 2004).

As blood Pb is an integrated marker of aggregate Pb exposure across all pathways, the blood Pb C–R relationships described in epidemiological studies of Pb-exposed populations do not distinguish among different sources of Pb or pathways of Pb exposure (*e.g.*, inhalation, ingestion of indoor dust, ingestion of dust containing leaded paint). Thus, our interpretation of the health effects evidence for purposes of this review necessitates characterization of the relationships between Pb from those sources and pathways of interest in this review (*i.e.*, those related to Pb emitted into the air) and blood Pb.

The evidence for air-to-blood relationships derives from analyses of datasets for populations residing in areas with differing air Pb concentrations, including datasets for circumstances in which blood Pb levels have changed in response to changes in air Pb. The control for variables other than air Pb that can affect blood Pb varies across these analyses. At the conclusion of the last review in 2008, the EPA interpreted the evidence as providing support for use (in informing the Administrator's decision on standard level) of a range of air-to-blood ratios[44] "inclusive at the upper end of estimates on the order of 1:10 and at the lower end on the order of 1:5" (73 FR 67002, November 12, 2008). This conclusion reflected consideration of the air-to-blood ratios presented in the 1986 CD[45] and associated observations regarding factors contributing to variation in such ratios, ratios reported subsequently and ratios estimated based on modeling performed in the REA, as well as advice from CASAC (73 FR 66973–66975, 67001–67002, November 12, 2008). The information available in this review, which is assessed in the ISA and largely, although not completely, comprises studies that were available in the last review, does not alter the primary scientific conclusions drawn in the last review regarding the relationships between Pb in ambient air and Pb in children's blood. The ratios summarized in the ISA in this review span a range generally consistent with the range concluded in 2008 (ISA, section 3.5.1).

The evidence pertaining to the quantitative relationship between air Pb and children's blood Pb is now, as in the past, limited by the circumstances in which the data are collected. These estimates are generally developed from studies of populations in a variety of Pb exposure circumstances. Accordingly, there is significant variability in air-to-blood ratios among the different study populations exposed to Pb through different air-related exposure pathways and at different exposure levels. This variability in air-to-blood estimates can relate to the representation of air-related pathways and study populations, including, for example, relatively narrow age ranges for the population in order to reduce age-related variability in blood Pb, or including populations with narrowly specified dietary sources. It

[44] The quantitative relationship between ambient air Pb and blood Pb, often termed a slope or ratio, describes the increase in blood Pb (in µg/dL) estimated to be associated with each unit increase of air Pb (in µg/m^3). Ratios are presented in the form of 1:x, with the 1 representing air Pb (in µg/m^3) and x representing blood Pb (in µg/dL). Description of ratios as higher or lower refers to the values for x (*i.e.*, the change in blood Pb per unit of air Pb). Slopes are presented as simply the value of x.

[45] The 2006 CD did not include an assessment of then-current evidence on air-to-blood ratios.

can relate to the study population exposure and blood Pb levels (ISA, section 3.7.4). It can also relate to the precision of air and blood measurements and of the study circumstances, such as with regard to spatial and temporal aspects. Additionally, in situations where exposure to nonair sources covaries with air-related exposures that are not accounted for in deriving ratio estimates, uncertainties may relate to the potential for confounding by nonair exposure covariance (ISA, section 3.5). Most of the studies assessed in the ISA and PA have reported ratios for which the relationship is linear, while a subset are derived from nonlinear models (PA, Table 3–1; ISA, section 3.7.4).

As was noted in the last review, age is an important influence on the magnitude of air-to-blood ratio estimates derived. Ratios for children are generally higher than those for adults, and higher for young children than older children, perhaps due to behavioral differences between the age groups, as well as their shorter exposure history. Similarly, given the common pattern of higher blood Pb levels in pre-school-aged children than during the rest of childhood, related to behaviors that increase environmental exposures (*e.g.*, hand-to-mouth activity), ratios would be expected to be highest in earlier childhood. Additionally, estimates of air-to-blood ratios that include air-related ingestion pathways in addition to the inhalation pathway are "necessarily higher," in terms of blood Pb response, than those estimates based on inhalation alone (1986 CD, p. 11–106). Thus, the extent to which studies account for the full set of air-related inhalation and ingestion exposure pathways affects the magnitude of the resultant air-to-blood estimates, such that including fewer pathways as "air-related" yields lower ratios. Estimates of air-to-blood ratios can also be influenced by population characteristics that may influence blood Pb; accordingly, some analyses include adjustments.

Given the recognition of young children as a key at-risk population in this review, as in the last (as discussed in section II.B.3 above), as well as the influence of age on blood Pb levels, we have considered the available studies in groups based on the extent of their inclusion of children younger than or barely school age (less than or equal to 5 years of age). Among the first group of studies, focused exclusively on young children, only one study dates from the end of or after the phase-out of leaded gasoline usage (Hilts, 2003). This study reports changes in children's blood Pb levels associated with reduced Pb emissions and associated air concentrations near a Pb smelter in Canada (for children through age 5). Given the timing of this study, after the leaded gasoline phase-out, and its setting near a smelter, the ambient air Pb in this study may be somewhat more comparable to that near sources in the U.S. today than other studies discussed herein. The study authors report an air-to-blood ratio of 1:6.[46] An EPA analysis of the air and blood data reported for 1996, 1999 and 2001 results in a ratio of 1:6.5, and an analysis focused only on the 1996 and 1999 data (pre- and post-the new technology) yields a ratio of 1:7 (ISA, section 3.5.1; Hilts, 2003).[47] The two other studies that focused on children of age 5 or younger analyzed variations in air Pb as a result of variations in leaded gasoline usage in Chicago, Illinois and reported somewhat higher ratios of 1:8 and 1:6.6 (Hayes et al., 1994; Schwartz and Pitcher, 1989). We note, however, the blood Pb concentrations in the two leaded gasoline studies are appreciably higher (a factor of two or more) than those in the study near the smelter (Hilts, 2003), and also than those commonly reported in the U.S. today.

The second group of studies includes but is not limited to children less than or equal to 5 years of age. This group includes a complex statistical analysis and associated dataset for a cohort of children born in Mexico City from 1987 through 1992 (Schnaas et al., 2004). Although this study, which was not assessed in the last review, encompasses the period of leaded gasoline usage, it further informs our understanding of factors influencing the quantitative relationship between air Pb and children's blood Pb. Air-to-blood ratios developed from this study are influenced by a number of factors and appear to range from roughly 1:2 to 1:6, in addition to an estimate of 1:9 (ISA, section 3.5.1), although the latter is derived from a data set restricted to the latter years of the study when little change in air Pb concentration occurred, such that the role of air Pb may be more uncertain. Estimates associated with the developmental period of highest exposure (*e.g.*, age 2 years) range up to approximately 1:6, illustrating the influence of age on the ratio (ISA, section 3.5.1). Also in the second group of studies are two much older studies of populations with age ranges extending well beyond 6 years. The first is the review and meta-analysis by Brunekreef (1984) using datasets available at the time for variously aged children as old as 18 years with identified air monitoring methods and reliable blood Pb data for 18 locations in the U.S. and internationally.[48] Two air-to-blood ratio estimates derived from this study based on log-log models both round to 1:5 (for air concentrations corresponding to the geometric means of the two sets of data pairs [1.5 and 0.54 μg/m³]). A ratio on the order of 1:9 was derived based on the study by Schwartz and Pitcher (1989) of the relationship between U.S. NHANES II blood Pb levels for white subjects, aged ≤74 years, and national usage of leaded gasoline, adjusted for age and other covariates (Henderson, 2007a, pp. D–2 to D–3; ISA, Table 3–12).

The last two studies are focused on older children, ages 6–11 in India and Germany (Tripathi et al., 2001; Ranft et al., 2008) and employed methods to characterize media Pb concentrations that differed from the other studies assessed (PA, p. 3–11). The location-specific geometric mean blood Pb levels in the Indian study (8.6–14.4 μg/dL) indicate blood Pb distributions in this age group much higher than those pertinent to similarly aged children in the U.S. today and the air-to-blood ratio

[46] Sources of uncertainty include the role of factors other than ambient air Pb reduction in influencing decreases in blood Pb (ISA, section 3.5.1). The author cited remedial programs (*e.g.*, community and home-based dust control and education) as potentially responsible for some of the blood Pb reduction seen during the study period (1997 to 2001), although the author notes that these programs were in place in 1992, suggesting they are unlikely to have contributed to the sudden drop in blood Pb levels occurring after 1997 (Hilts, 2003). Other aspects with potential implications for ratios include the potential for children with lower blood Pb levels not to return for subsequent testing, and the age range of 6 to 36 months in the 2001 blood screening compared to ages up to 60 months in earlier years of the study (Hilts, 2003).

[47] This study considered changes in ambient air Pb levels and associated blood Pb levels over a 5-year period which included closure of an older Pb smelter and subsequent opening of a newer facility in 1997 and a temporary (3-month) shutdown of all smelting activity in the summer of 2001. The author observed that the air-to-blood ratio for children in the area over the full period was approximately 1:6. The author noted limitations in the dataset associated with exposures in the second time period, after the temporary shutdown of the facility in 2001, including sampling of a different age group at that time and a shorter time period (3 months) at these lower ambient air Pb levels prior to collection of blood Pb levels. Consequently, the EPA calculated an alternate air-to-blood Pb ratio based on ambient air Pb and blood Pb reductions in the first time period, after opening of the new facility in 1997 (ISA, section 3.5.1).

[48] In the dataset reviewed by Brunekreef (1984), air-to-blood ratios from the subset of those studies that used quality control protocols and presented adjusted slopes include values of 3.6, (Zielhuis et al., 1979), 5.2 (Billick et al., 1979, 1980); 2.9 (Billick, 1983), and 6.5 (Brunekreef et al., 1983). The studies cited here adjusted for parental education (Zielhuis et al., 1979), age and race (Billick et al., 1979, 1980) and air Pb monitor height (Billick, 1983); Brunekreef (1984) used multiple regression to control for several confounders (73 FR 66974).

estimate reported was 1:3.6 (Tripathi et al., 2001). The more recent German study by Ranft et al. (2008) analyzed data from a nearly 20-year period associated with the leaded gasoline phase-out, during which average blood Pb levels declined from 9 μg/dL in 1983 (345 children, average age of 9 years) to 3 μg/dL in 2000 (162 children, average of 6 years).[49] Average air Pb concentration declined from 0.45 μg/m³ to 0.06 μg/m³ over the same period, with the largest reduction occurring between the first study year (derived from two monitoring sites for full study area) and the second study year, 1991, for which air concentrations were derived from a combination of dispersion modeling and the two monitoring sites.[50] For a mean air Pb concentration of 0.1 μg/m³, the study's multivariate loglinear regression model predicted air-to-blood ratios of 3.2 and 6.4 for "background" blood Pb concentrations of 1.5 and 3 μg/dL, respectively. In this study, background referred to Pb in blood from other sources; the blood Pb distribution over the study period, including levels when air Pb concentrations are lowest, indicates 3 μg/dL may be the better estimate of background for this study population. Inclusion of soil Pb as a variable in the model may have contributed to an underestimation of the blood Pb-air Pb ratios for this study because some of the Pb in soil likely originated in air and the blood Pb-air Pb slope does not include the portion of the soil/dust Pb ingestion pathway that derives from air Pb. Using univariate linear, log-log and loglinear models on the median air and blood Pb concentrations reported for the 5 years included in this study, the ISA also derived air-to-blood ratio estimates for data from this study ranging from 9 to 17 (ISA, p. 3–126; Ranft et al., 2008, Table 2). Uncertainties related to this study's estimates include those related to the bulk of air concentration reduction occurring between the first two time points (1983 and 1991) and the difference among the year's air datasets (*e.g.*, two data sources [air monitors] in 1983 and multiple geographical points from a combination of the monitors and modeling in subsequent years).

In this review, as in the 2008 Pb NAAQS review, in addition to considering the evidence presented in the published literature and that reviewed in the 1986 CD, we also consider air-to-blood ratios derived from the exposure assessment (PA, p. 3–14; 73 FR 66974, November 12, 2008; 2007 REA, section 5.2.5.2). In the exposure assessment (summarized in section II.D below), current modeling tools and information on children's activity patterns, behavior and physiology were used to estimate blood Pb levels associated with multimedia and multipathway Pb exposure. The results from the various case studies assessed, with consideration of the context in which they were derived (*e.g.*, the extent to which the range of air-related pathways was simulated, and the limitations associated with those simulations), and the multiple sources of uncertainty are also informative to our understanding of air-to-blood ratios. Estimates of air-to-blood ratios for the two REA case studies that represent localized population exposures exhibited an increasing trend across air quality scenarios representing decreasing air concentrations. For example, across the alternative standard levels assessed, which ranged from a calendar quarter average of 1.5 μg/m³ down to a monthly average of 0.02 μg/m³, the ratios ranged from 1:2 to 1:9 for the generalized (local) urban case study, with a similar trend, although of generally higher ratio, for the primary smelter case study subarea. This pattern of model-derived ratios is generally consistent with the range of ratios obtained from the literature, briefly discussed above. We continue to recognize a number of sources of uncertainty associated with these model-derived ratios which may contribute to high or low biases (as discussed further in section 3.1 of the PA).

The evidence on the quantitative relationship between air Pb and air-related Pb in blood is now, as in the past, limited by the circumstances (such as those related to Pb exposure) in which the data were collected. Previous reviews have recognized the significant variability in air-to-blood ratios for different populations exposed to Pb through different air-related exposure pathways and at different air and blood levels, with the 1986 CD noting that ratios derived from studies involving the higher blood and air Pb levels pertaining to occupationally exposed workers are generally smaller than ratios from studies involving lower blood and air Pb levels (ISA, p. 3–132; 1986 CD, p. 11–99). Consistent with this observation, slopes in the range of 3 to 5 were estimated for child population datasets assessed in the 1986 CD (ISA, p. 3–132; 1986 CD p. 11–100; Brunekreef, 1984). Additional studies considered in the last review and those assessed in the ISA provide evidence of ratios above this older range (ISA, p. 3–133). For example, a ratio of 1:6.5–1:7 is indicated by the study by Hilts (2003), one of the few studies that evaluate the air Pb-blood Pb relationship in conditions that are closer to the current state in the U.S. (ISA, p. 3–132). We additionally note the variety of factors identified in the ISA that may potentially affect estimates of various ratios (including potentially coincident reductions in nonair Pb sources during the course of the studies), and for which a lack of complete information may preclude any adjustment of estimates to account for their role (ISA, section 3.5).

In summary, as at the time of the last review of the NAAQS for Pb, the currently available evidence includes estimates of air-to-blood ratios, both empirical and model-derived, with associated limitations and related uncertainties. These limitations and uncertainties, which are summarized here and also noted in the ISA, usually include uncertainty associated with reductions in other Pb sources during the study period. The limited amount of new information available in this review has not appreciably altered the scientific conclusions reached in the last review regarding relationships between Pb in ambient air and Pb in children's blood or with regard to the range of ratios. The currently available evidence continues to indicate ratios relevant to the population of young children in the U.S. today, reflecting multiple air-related pathways in addition to inhalation, to be generally consistent with the approximate range of 1:5 to 1:10 given particular attention in the 2008 NAAQS decision, including the "generally central estimate" of 1:7 (73 FR 67002, 67004, November 12, 2008; ISA, pp. 3–132 to 3–133).

D. Summary of Risk and Exposure Assessment Information

The risk information available for this review and summarized here is based primarily on the exposure and risk assessment developed in the last review of the Pb NAAQS, described in the 2007 REA, the 2007 Staff Paper and the 2008 notice of final decision (USEPA, 2007a; USEPA, 2007b; 73 FR 66964, November 12, 2008), as considered in the context of the evidence newly available in this review (PA, section 3.4). As described in

[49] Blood Pb measurements were available on a total of 843 children across five time periods, in the first of which the average child age was 9 years while it was approximately 6 years in each of the latter years: 1983 (n=356), 1991 (n=147), 1994 (n=122), 1997 (n=56), and 2000 (n=162) (Ranft et al., 2008).

[50] The 1983 air Pb concentrations were based on two monitoring stations, while a combination of dispersion modeling and monitoring data was used in the later years. Surface soil Pb measurements were from 2000–2001, but geo-matched to blood Pb measurements across full study period (Ranft et al., 2008).

the REA Planning Document, careful consideration of the information newly available in this review, with regard to designing and implementing a full REA for this review, led to the conclusion that performance of a new REA for this review was not warranted. We did not find the information newly available in this review to provide the means by which to develop an updated or enhanced risk model that would substantially improve the utility of risk estimates in informing the current Pb NAAQS review (REA Planning Document, section 2.3). Based on their consideration of the REA Planning Document analysis, the CASAC Pb Review Panel generally concurred with the conclusion that a new REA was not warranted in this review (Frey, 2011b).[51] Accordingly, the risk/exposure information considered in this review is drawn primarily from the 2007 REA, augmented by a limited new computation for one case study focused on risk associated with the current standard, as described below (PA, section 3.4 and Appendix 3A).

1. Overview

The focus for the risk assessment and associated estimates is on Pb derived from sources emitting Pb to ambient air. As discussed in section I.D above, the multimedia and persistent nature of Pb, the role of multiple exposure pathways, and the contributions of nonair sources of Pb to human exposure media all present challenges and contribute significant additional complexity to the health risk assessment that goes far beyond the situation for similar assessments typically performed for other NAAQS pollutants (*e.g.*, that focus only on the inhalation pathway). The conceptual model that informed planning for the 2007 REA identified sources, pathways, routes, exposed populations, and health endpoints, focusing on those aspects of Pb exposure most relevant to the review, while also recognizing the role of Pb exposure pathways unrelated to Pb in ambient air (2007 REA, section 2.1). Limitations in the available data and models affected our characterization of the various complexities associated with exposure to ambient air Pb. As a result, the assessment included a number of simplifying assumptions in a number of areas and the estimates of air-related Pb risk produced are approximate and are characterized by upper and lower bounds.

As recognized in I.D above, sources of human Pb exposure include current and historical air emissions sources, as well as miscellaneous nonair sources, which can contribute to multiple exposure media and associated pathways (*e.g.*, inhalation of ambient air, ingestion of indoor dust, outdoor soil/dust and diet or drinking water). In addition to airborne emissions (recent or those in the past), sources of Pb to these pathways also include old leaded paint, including Pb mobilized indoors during renovation/repair activities, and contaminated soils. Lead in diet and drinking water may have air pathway-related contributions as well as contributions from nonair sources (*e.g.*, Pb solder on water distribution pipes and Pb in materials used in food processing). Limitations in our data and modeling tools handicapped our ability to fully separate the nonair contributions to Pb exposure from estimates of air-related Pb exposure and risk. As a result, we have developed bounds within which we estimate air-related Pb risk to fall. The lower bound is based on a combination of pathway-specific estimates that do not completely represent all air-related pathways, while the upper bound is based on a combination of pathway-specific estimates that includes pathways that are not air-related but the separating out of which is precluded by modeling and data limitations.

Inclusion of exposure populations, exposure/dose metric, health effects endpoint and risk metric in the 2007 REA were based on consideration of the then-currently available evidence as assessed in detail in the 2006 CD. As discussed in the REA Planning Document (USEPA, 2011b), these selections continue to be supported by the evidence now available in this review as described in the ISA. The REA focused on risk to the central nervous system in childhood as the most sensitive effect that could be quantitatively assessed, with decrement in IQ used as the risk metric. Exposure and biokinetic modeling was used to estimate blood Pb concentrations in children exposed to Pb up to age 7 years.[52] This focus reflected the evidence for young children with regard to air-related exposure pathways and susceptibility to Pb health impacts (*e.g.*, ISA, sections 3.1.1, 4.3, 5.2.1.1, 5.3.1.1, and 5.4). For example, the hand-to-mouth activity of young children contributes to their Pb exposure (*i.e.*, incidental soil and indoor dust ingestion) and ambient air-related Pb has been shown to contribute to Pb in outdoor soil and indoor house dust (ISA, sections 3.1.1 and 3.4.1; 2006 CD, section 3.2.3).

The 2007 REA relied on a case study approach to provide estimates that inform our understanding of air-related exposure and risk in different types of air Pb exposure situations. Lead exposure and associated risk were estimated for multiple case studies that generally represent two types of residential population exposures to air-related Pb: (1) Location-specific urban populations of children with a broad range of air-related exposures, reflecting existence of urban concentration gradients; and (2) children residing in localized areas with air-related exposures representing air concentrations specifically reflecting the standard level being evaluated (see PA, Table 3–6). Thus, the two types of case studies differed with regard to the extent to which they represented population variability in air-related Pb exposure.

In drawing on the 2007 REA for our purposes in this review, we focused on two case studies, one from each of these two categories: (1) The location-specific urban case study for Chicago and (2) the generalized (local) urban case study (PA, Table 3–6). Accordingly, our summary of analysis details below focuses on details particular to these two case studies. The generalized (local) urban case study (also referred to as *general urban case study*) was not based on a specific geographic location and reflected several simplifying assumptions in representing exposure including uniform ambient air Pb levels associated with the standard of interest across the hypothetical study area and a uniform study population. Based on the nature of the population exposures represented by the two categories of case study, the generalized (local) urban case study includes populations that are relatively more highly exposed by way of air pathways to air Pb concentrations near the standard level evaluated, compared with the populations in the location-specific urban case. The location-specific urban case studies provided representations of urban populations with a broad range of air-related exposures due to spatial gradients in both ambient air Pb levels and population density. For example, the highest air concentrations in these case studies (*i.e.*, those closest to the standard being assessed) were found in very small parts of the study areas, while a large majority of the case study

[51] In their review of the draft PA, the CASAC Pb Review Panel reinforced their concurrence with the EPA's decision not to develop a new REA (Frey, 2013).

[52] The pathways represented in this modeling included childhood inhalation and ingestion pathways, as well as maternal contributions to newborn body burden (2007 REA, Appendix H, Exhibit H–6).

populations resided in areas with much lower air concentrations.

2. Summary of Design Aspects

The approach to assessing exposure and risk for the two categories of case studies was comprised of four main analytical steps: (1) Estimation of ambient air Pb concentrations, (2) estimation of Pb concentrations in other key exposure media, including outdoor soil and indoor dust, (3) use of exposure media Pb concentrations, with other pathway Pb intake rates (*e.g.*, diet), to estimate blood Pb levels in children using biokinetic modeling, and (4) use of C–R functions derived from epidemiological studies to estimate IQ loss associated with the blood Pb levels.

Concentrations of Pb were estimated in ambient media and indoor dust using a combination of empirical data and modeling projections. The use of empirical data brings with it uncertainty related to the potential inclusion of nonair source signals in these measurements (*e.g.*, house paint contributions to indoor dust and outdoor soil Pb). Conversely, the use of modeling tools introduces other uncertainties (*e.g.*, model and parameter uncertainties).

Characterization of Pb in ambient air relied on (1) the use of ambient monitor data for the location-specific urban case studies and (2) an assumption of uniform ambient air Pb levels (matching the standard level being considered) for the generalized (local) urban case study. For the location-specific urban case studies, we used Pb monitors within each study area to characterize spatial gradients. By contrast, the generalized (local) urban case study is designed to assess exposure and risk for a smaller group of residents (*e.g.*, neighborhood) exposed at the level of the standard and, therefore, did not rely on monitor data; rather, ambient air Pb concentration was fixed at the standard being assessed. For the generalized (local) urban case study, which has a single exposure zone in which air Pb concentrations do not vary spatially, we derived a single air Pb concentration estimate to meet the standard assessed. Concentrations in the location-specific urban study areas, which relied on empirical (monitor-based) data to define ambient air Pb concentrations, reflected contributions from all sources affecting the concentrations in those locations, be they currently active stationary or mobile sources, resuspension of previously deposited Pb or other.[53]

The air quality scenarios assessed in the 2007 REA included conditions just meeting the NAAQS that was current at the time of the last review (1.5 μg/m³, as a calendar quarter average), conditions meeting several alternative, lower standards,[54] and current conditions in the three location-specific urban case studies (PA, section 3.4.3.2). The full impact of changes in air Pb conditions associated with attainment of lower standards was not simulated, however, due to limitations in the available data and modeling tools that precluded simulation of linkages between some media and air Pb. Specifically, while Pb concentrations in indoor dust were simulated to change with the different air quality scenarios for which there were differing ambient air Pb concentrations (outdoors and indoors), dietary and drinking water Pb concentrations, as well as soil Pb concentrations, were not varied across the air quality scenarios in any case study (see PA, Table 3–7).[55]

In estimating blood Pb levels using the IEUBK model, Pb concentrations in exposure media (*e.g.*, ambient air, diet, water, indoor dust) were held constant throughout the 7-year simulation period, while behavioral and physiological variables were changed with age of child (2007 REA, sections 3.2.1.1 and 5.2.4). Detail on methods used to characterize media Pb concentrations and all IEUBK inputs for each case study are in the 2007 REA, sections 3.1, 3.2, 5.2.3 and 5.2.4, and appendices C through H. Population variability in Pb intake and uptake was simulated through use of the IEUBK model to first generate a central-tendency estimate of the blood Pb levels for the group of children within a given exposure zone of a study area, coupled with use of a geometric standard deviation (GSD) and for the location-specific case studies, Monte Carlo-based population sampling (PA, section 3.4; 2007 REA, Appendix H). The risk characterization step employed in the 2007 REA generated a distribution of IQ loss estimates for the set of children simulated in the assessment.

Specifically, blood Pb estimates for the concurrent blood Pb metric[56] were combined with four C–R functions for blood Pb concentration with IQ loss based on the analysis by Lanphear et al. (2005) of a pooled international dataset of blood Pb and IQ (see the 2007 REA, section 5.3.1.1). We used the four different C–R functions to provide different characterizations of behavior at low exposures in recognition of uncertainty related to modeling this endpoint, particularly at lower blood Pb levels for which there is limited representation in the Lanphear et al. (2005) pooled dataset.[57] In considering the risk estimates here (as in the last review), we focus on estimates for one of the four functions (referred to as the loglinear with low-exposure linearization C–R function [PA, section 3.4.3.3]). The range of risk estimates reflecting all four C–R functions provide perspective on the impact of uncertainty in this key modeling step. Additional detail on the C–R functions is provided in the PA and the 2007 Pb Staff Paper (PA, section 3.4.3.3; USEPA, 2007b, section 4.2.1).[58] We focus on the median IQ loss estimates, as in the last review, due to increased confidence in these estimates relative to the higher percentile estimates, for which we recognize significant uncertainty (PA,

[53] Additional detail on estimation of ambient (outdoor) and indoor air concentrations is presented in section 5.2.2 and Appendices A through D of the 2007 REA.

[54] The alternatives lower than the NAAQS at the time of the last review for which air quality scenarios were assessed were a maximum calendar quarter average of 0.2 μg/m³ and maximum monthly averages of 0.5, 0.2, 0.05 and 0.02 μg/m³ (PA, Table 3–8).

[55] Characterization of Pb concentrations in outdoor surface soil/dust for the generalized (local) and location-specific urban cases studies was based on the use of nationally representative residential soil measurements obtained from the literature (2007 REA, sections 3.1.3 and 5.2.2.2 and Appendix F). Diet and drinking water intake and concentrations, as well as other model inputs, were based on the most current information (2007 REA, Appendix H).

[56] As in the last review, we give primary emphasis to estimates based on the concurrent blood Pb metric, consistent with CASAC advice in the last review (Henderson, 2007b).

[57] The 5th percentile for the concurrent blood Pb measurements in that dataset is 2.5 μg/dL, and the median is 9.7 μg/dL (Lanphear et al., 2005).

[58] As noted in section II.B.3 above, since the completion of the ISA in the current review, two errors have been identified with the pooled dataset analyzed by Lanphear et al., (2005) (Kirrane and Patel, 2014). The EPA and a recent publication have separately recalculated the statistics and mathematical models of Lanphear et al., (2005) using the corrected pooled dataset (Kirrane and Patel, 2014). While the conclusions drawn from these coefficients, including the finding of a steeper slope at lower (as compared to higher) blood Pb concentrations, are unaffected, the magnitude of the loglinear and linear regression coefficients are somewhat lower based on the corrections. For example, the loglinear model coefficient used for the C–R function, on which the EPA focused in the last review and also focuses on here, changed only negligibly from −2.7 to −2.65 when recalculated using the corrected pooled dataset (Kirrane and Patel, 2014). As a result, the risk estimates for this function would be expected to be very similar although slightly lower if derived using the recalculated loglinear model coefficient for the corrected dataset. Since the loglinear model coefficient calculated from the corrected dataset is unchanged at two significant figures from that original reported, any change to the risk estimates would be very small and, particularly in light of other uncertainties in the analysis, does not materially affect staff's consideration of the results.

sections 3.4.5, 3.4.6 and 3.4.7; 2007 Staff Paper, p. 4–20).

As the 2007 REA did not include an air quality scenario simulated to just meet the standard selected by the 2008 decision,[59] we employed two different approaches to estimate risk pertaining to conditions just meeting the current Pb standard (set in 2008) for our purposes in this review. First, given the similarity to the current standard of the then-current conditions scenario for the Chicago case study (among all the 2007 REA scenarios), we consider the risk estimates for that scenario as informative with regard to risk associated with the current standard.[60] To augment the risk information available in this current review and in recognition of the variation among specific locations and urban areas with regard to air quality patterns and exposed population, we have also newly developed estimates for an air quality scenario just meeting the current Pb NAAQS in the context of the generalized (local) urban case study. These estimates were derived based on interpolation from the risk estimates available for scenarios previously assessed for the generalized (local) urban case study. Such interpolated estimates were only developed for the generalized urban case study due to its use of a single exposure zone which greatly simplified the method employed.[61]

The general approach we followed to newly develop estimates for the current standard in the generalized (local) urban case study was to identify the two alternative standard scenarios simulated in the 2007 REA which represented air quality conditions bracketing those for the current standard and then linearly interpolate an estimate of risk for the current standard based on the slope created from the two bracketing estimates (PA, section 3.4.3.3.2 and Appendix 3A). By this method, the air quality scenario for the current standard (0.15 μg/m³, as a not-to-be-exceeded 3-month average) was found to be bracketed by the scenarios for alternative standards of 0.20 μg/m³ (maximum calendar quarter average) and 0.20 μg/m³ (maximum monthly average). Using interpolation between the risk estimates for these two scenarios, we developed median risk estimates for the current standard (PA, Appendix 3A).

3. Key Limitations and Uncertainties

In characterizing risk associated with Pb from air-related exposure pathways, we faced a variety of challenges and employed a number of methods. The challenges related to significant data and modeling limitations which affected our ability to parse out the portion of total (all-pathway) blood Pb and IQ loss attributable to air-related pathways, as well as our representation of key sources of variability and characterization of uncertainty. Although we separated total estimates into risk estimates for diet/drinking water and two air-related categories ("recent air" and "past air"), significant limitations in our modeling tools and data resulted in an inability to parse risk estimates specific to the air-related pathways. For example, we recognize that Pb in diet and drinking water sources may include some Pb derived from Pb in the ambient air, as well as Pb from nonair sources, but limitations precluded explicit modeling of the contribution from air pathways to these exposure pathways, such that the air-related component of these exposures was not estimated. Rather, we focused on estimates from the two air-related categories, which we considered to under- and over-estimate air-related risk, respectively, to create bounds within which we consider air-related risk to fall.

The first air-related category ("recent") included Pb exposure pathways tied most directly to ambient air, which consequently have the potential to respond relatively more quickly to changes in air Pb (*i.e.*, inhalation and ingestion of indoor dust Pb derived from the infiltration of ambient air Pb indoors). Importantly, media concentrations associated with the pathways in this category were simulated to change in response to air concentrations (as noted in section II.D.2 above and described in section 3.4.3.1 of the PA). The air-related Pb exposure pathways in the second air-related category ("past air"), all of which are associated with atmospheric deposition, included ingestion of Pb in outdoor dust/soil and ingestion of the portion of Pb in indoor dust that after deposition from ambient air outdoors is carried indoors with humans. While there is the potential for these other air-related exposures to be affected (over some time frame) by changes in air Pb concentrations (associated with an adjustment to the Pb standard), limitations in our data and tools precluded simulation of that relationship. Consequently, risk estimated for this category reflects media measurements available for the 2007 REA and is identical for all air quality scenarios. Further, although paint is not an air-related source of Pb exposure, it may be reflected somewhat in estimates developed for the "past air" category, due to modeling constraints (2007 Staff Paper, section 4.2.4). Thus, as exposures included in the first air-related category ("recent") do not completely capture all air-related pathways, we consider risk for this category an underestimate of air-related risk. Yet, as exposures included in the second air-related category include pathways that are not air-related, we consider the summed risk across both categories to include a slight over-estimate of air-related risk.

In summary, because of limitations in the assessment design, data and modeling tools, we consider our estimates of risk attributable to air-related exposure pathways to be approximate and to be bounded on the low end by the risk estimated for the "recent air" category and on the upper end by the risk estimated for the "recent air" plus "past air" categories. With regard to the latter, we are additionally cognizant of the modeling and data limitations which reduce the extent to which the upper end of these bounds reflects impacts of alternative air quality conditions simulated. We note that this limitation will tend to contribute to estimates for the "past air" category representing relatively greater overestimates with relatively lower air Pb air quality scenarios.

We recognize several important sources of variability in air-related Pb exposures and associated risk, for which the approaches by which they were addressed in the 2007 REA are summarized here (PA, section 3.4.6).

• Variation in distributions of potential urban residential exposure and risk across U.S. urban residential areas is addressed by the inclusion of location-specific urban study areas that reflect a diverse set of urban areas in the U.S.

[59] The 2008 decision on the level for the revised NAAQS was based primarily on consideration of the evidence-based air-related IQ loss framework; risk estimates available for scenarios simulated in the 2007 REA were concluded to be roughly consistent with and generally supportive of the evidence-based air-related IQ loss estimates (see section II.A.1 above).

[60] In the Chicago urban case study, the maximum monthly average concentration was 0.31 μg/m³, and the maximum calendar quarter average concentration was 0.14 μg/m³ (2003–2005 data; 2007 REA, Appendix O).

[61] We did not interpolate risk estimates for the current standard for the other case studies (*i.e.*, the primary Pb smelter and location-specific urban case studies) because those case studies utilized a more complex, spatially-differentiated and population-based approach (see 2007 REA) which precludes application of the simple linear interpolation approach described, without introduction of substantial added uncertainty (relative to the other estimates for the same case study). The simplicity of the generalized (local) urban study area, however, with its single exposure zone, is amenable to the linear interpolation of risk described here.

• Representation of a more highly exposed subset of urban residents potentially exposed at the level of the standard is addressed by the inclusion of the generalized (local) urban study area.

• Variation in residential exposure to ambient air Pb within an urban area of the location-specific case studies is addressed through the partitioning of these study areas into exposure zones to provide some representation of spatial gradients in ambient air Pb and their interaction with population distribution and demographics.

• Inter-individual variability in blood Pb levels is addressed through the use of empirically derived GSDs to develop blood Pb distribution for the child population in each exposure zone, with GSDs selected particular to each case study population.

• Inter-individual variability in IQ response to blood Pb is addressed through the use of C–R functions for IQ loss based on a pooled analysis reflecting studies of diverse populations.

With regard to uncertainties, we recognize one overarching area concerning the precision of our estimation of the neurocognitive risk (as represented by IQ loss) associated with ambient air Pb. For reasons related to the evidence of nonlinear responses of blood Pb to Pb exposure and of Pb-associated IQ response to blood Pb, the 2007 REA first estimated blood Pb levels and associated risk for total Pb exposure (*i.e.*, including Pb from air-related and nonair exposure pathways) and then separated out estimates for pathways of interest (PA, section 3.4.4). However, as described above, significant limitations in our modeling tools affected our ability to develop precise estimates for air-related exposure pathways. We believe these limitations led to a slight overestimation of the risks for the "past air" category and to an under-representation of air-related pathways for the "recent air" category. Thus, we characterized the risk attributable to air-related exposure pathways to be bounded by the estimates developed for the "past air" category and the sum of estimates for the "recent air" and "past air" categories. For air quality scenarios other than those for the previous NAAQS, this upper bound is recognized as having a potential upward bias with regard to its reflection of the simulated air quality conditions because modeling and data limitations precluded simulation of the influence of lower air Pb concentrations on the outdoor dust and soil exposure pathways (PA, section 3.4.4).

We recognize a range of additional uncertainties, limitations, and assumptions that are reflected in various ways in the 2007 REA and associated results (PA, section 3.4.7), which include the following.

• *Temporal Aspects:* During the 7-year exposure period, media concentrations remain fixed and the simulated child resides at the same residence (although exposure factors, including behavioral and physiological parameters, are adjusted to match the aging of the child). These aspects introduce uncertainty into the risk estimates, although the existence of a directional bias is unclear.

• *Generalized (local) Urban Case Study:* The design for this case study employs assumptions regarding uniformity that are reasonable in the context of a general description of a small neighborhood population but would contribute significant uncertainty to extrapolation of these estimates to a specific urban location, particularly a relatively large one. An additional area of uncertainty concerns the representation of variability in air quality. Given the relatively greater variability common in areas of high Pb concentrations, the approach used to reflect variability may bias the estimates high.

• *Location-specific Urban Case Studies:* Limitations in the spatial density of ambient air monitors in the simulated areas limit our characterization of spatial gradients of ambient air Pb levels in these case studies. This factor introduces uncertainty into the risk estimates for this category of case study; the existence of a directional bias is unclear.

• *Air Quality Simulation:* Focus on only then-current conditions (2003–2005) scenario for the Chicago urban case study in this review precludes uncertainty associated with simulations of alternative air quality scenarios in the 2007 REA.

• *Outdoor Soil/Dust Pb Concentrations:* Limitations in datasets on Pb levels in surface soil/dust Pb in urban areas and in our ability to simulate the impact of reduced air Pb levels related to lowering the NAAQS in the 2007 REA contribute uncertainty to the air-related risk estimates for the current standard in the generalized (local) urban case study. The likely impact is a high bias on these risk estimates (related to low bias on estimating risk reduction for lower standard levels in the 2007 REA) given lack of simulated changes in soil Pb related to changes in ambient air Pb.

• *Indoor Dust Pb Concentrations:* Limitations and uncertainty in modeling of indoor dust Pb levels, including the impact of reductions in ambient air Pb levels, contributes uncertainty to air-related risk estimates. Although the indoor dust modeling does link changes in ambient air Pb to changes in indoor dust Pb, it does not include a link between ambient air Pb, outdoor soil Pb and subsequent changes in the level of Pb carried (or "tracked") into the house. This could introduce low bias into the total estimates of air-related Pb exposure and risk.

• *Interindividual Variability in Blood Pb Levels:* Uncertainty related to population variability in blood Pb levels related to interindividual variability in factors other than media concentration and limitations in modeling of this introduces significant uncertainty into blood Pb and IQ loss estimates for the 95th percentile of the population. The extent of any systematic bias from this source of uncertainty is unknown.

• *Pathway Apportionment for Higher Percentile Blood Pb and Risks:* Limitations, primarily in data, prevented us from characterizing the degree of correlation among high-end Pb exposures for the various pathways (*e.g.*, the degree to which an individual experiencing high drinking water Pb exposure would also experience high Pb paint exposure and high ambient air-related Pb exposure). Our inability to characterize potential correlations between exposure pathways (particularly at the higher percentile exposure levels) limited our ability to (1) effectively model high-end Pb risk and (2) apportion that risk between different exposure pathways, including ambient air-related pathways.

• *IQ Loss C–R Functions:* Specification of the quantitative relationship between blood Pb level and IQ loss is subject to greater uncertainty at lower blood Pb levels. The use of four C–R functions models (which each treat the response at low blood Pb levels in a different manner) is considered to provide a reasonable characterization of this source of uncertainty and its impact on risk estimates. Comparison of risk estimates from the four models indicates this source of uncertainty to have a potentially significant impact on risk.

4. Summary of Risk Estimates and Key Observations

In this summary of risk estimates, drawn from the PA, we focus on the estimates of air-related IQ loss derived using the C–R function in which we have greatest confidence (see PA, sections 3.4.3.3.1 and 3.4.7) for the median child in a given case study (exposure modeled through age 7 years), given the substantially greater uncertainty associated with air-related risk estimates for extremes of the risk distribution, such as the 95th percentile (PA, section 3.4). Estimates for other risk metrics and the full range of case studies and air quality scenarios are described elsewhere in detail (*e.g.*, 2007 REA, sections 4.2 and 5.3.2 and appendices; 2007 Staff Paper, chapter 4; 73 FR 66964, November 12, 2008). Based on results from the 2007 REA for a location-specific urban study area (Chicago case study) and on those newly derived in this review based on interpolation from the 2007 REA results (for the generalized (local) urban case study), median air-related IQ loss for the current standard is estimated, with rounding, to generally fall near or somewhat above a rough lower bound of 1 point IQ loss and below a rough upper bound of 3 points IQ loss. As would be expected by the use of interpolation, the newly derived estimates are consistent with the estimates for similar air quality scenarios that were available in the last review (PA, section 3.4.5). For example, the generalized (local) urban case study current standard scenario estimates for median air-related IQ loss are identical to those for the scenario of just meeting a potential alternative of 0.2 μg/m^3 maximum calendar quarter average for that case study (PA, Table 3–11). Further, the upper bound below which the median IQ loss is estimated to fall is also approximately 3 IQ points in the generalized (local) urban case study scenarios for just meeting potential alternatives of 0.2 μg/m^3, 0.05 and 0.02 μg/m^3 maximum monthly average, providing an indication of the limitations associated with estimating air-related Pb exposures and risk for lower air Pb scenarios (PA, sections 3.4.4 and 3.4.5).

As summarized in section II.D.3 above, a range of limitations and areas of uncertainty were associated with the information available in the last review (PA, sections 3.4.4, 3.4.6 and 3.4.7). In this review, the REA Planning Document concluded that none of the primary sources of uncertainty identified to have the greatest impact on risk estimates would be substantially reduced through the use of newly available information (USEPA, 2011b). Thus, the key observations regarding air-related Pb risk modeled for the set of standard levels assessed in the 2007 REA, as well as the risk estimates interpolated for the current standard, are not significantly affected by the new information. Further, our overall characterization of uncertainty and variability associated with those estimates (as summarized above and in sections 3.4.6 and 3.4.7 of the PA) is not appreciably affected by new information. As recognized at the time of the last review, exposure and risk modeling conducted for this analysis was complex and subject to significant uncertainties due to limitations in the data and models, among other aspects. Of particular note, limitations in the assessment design, data and modeling tools handicapped us from sharply separating Pb linked to ambient air from Pb that is not air related.

In summary, the estimates of risk attributable to air-related exposures, with which we recognize a variety of sources of uncertainty, are considered to be approximate, falling within upper and lower bounds. These bounds for scenarios just meeting the current standard are roughly estimated, with rounding, as 3 and 1 IQ points, which over- and underestimate risk, respectively. In characterizing the magnitude of air-related risk associated with the current standard, we focus on median estimates, for which we have appreciably greater confidence than estimates for outer ends of the risk distribution (see PA, section 3.4.7) and on risks derived using the C–R function in which we have greatest confidence (see PA, sections 3.4.3.3.1 and 3.4.7). These risk results for the current standard, both those estimated in the last review for one of the location-specific urban study area populations and those newly derived in this review using interpolation of the estimates from the last review for the generalized (local) urban case study, which is recognized to reflect a generalized high end of air-related exposure for localized populations, provide approximate bounds for air-related risk, with attendant uncertainties described above. Focusing on the results for the generalized (local) urban case study, the interpolated estimates for the scenario representing the current standard are very similar to estimates for the two 0.2 μg/m^3 scenarios (maximum monthly and calendar quarter averages) simulated in the 2007 REA [62] and are appreciably lower than those associated with the previous standard. For this case study, across the two 0.2 μg/m^3 scenarios, the current standard scenario and the more restrictive air quality scenarios, the upper bound below which air-related risk is estimated to fall rounds to the same value, reflecting the significant limitations associated with developing precise estimates of air-related risk, particularly for the lower air Pb scenarios (PA, sections 3.4.4, 3.4.5, and 3.4.7).

[62] There is uncertainty associated with judging differences between the current standard and these potential alternative standards due to the difference in air quality datasets used to estimate air concentration variability of the 2007 REA estimates versus the interpolated risk estimate.

E. Conclusions on Adequacy of the Current Primary Standard

In evaluating whether, in view of the advances in scientific knowledge and additional information now available, it is appropriate to retain or revise the current standard, the Administrator builds upon the last review and reflects upon the body of evidence and information now available. The Administrator has taken into account both evidence-based and quantitative exposure- and risk-based considerations in developing conclusions on the adequacy of the current primary Pb standard. Evidence-based considerations draw upon the EPA's assessment and integrated synthesis of the scientific evidence from epidemiological studies and experimental animal studies evaluating health effects related to exposures to Pb, with a focus on policy-relevant considerations as discussed in the PA. The exposure/risk-based considerations draw from the results of the quantitative analyses presented in the 2007 REA, augmented as described in the PA, and summarized in section II.D above, and consideration of those results in the PA. More specifically, estimates of the magnitude of ambient Pb-related exposures for young children and associated impacts on IQ associated with just meeting the current primary Pb NAAQS have been considered. Together the evidence-based and risk-based considerations have informed the Administrator's proposed conclusions related to the adequacy of the current Pb standard in light of the currently available scientific evidence.

As described in section II.A.2 above, consideration of the evidence and the exposure/risk information in the PA and by the Administrator is framed by consideration of a series of key policy-relevant questions. The following sections describe the consideration of these questions in the PA, the advice received from CASAC, as well as the comments received from various parties, and then present the Administrator's proposed conclusions regarding the adequacy of the current primary standard.

1. Evidence-Based Considerations in the Policy Assessment

In considering the evidence with regard to the issue of adequacy of the current standard, the PA addresses several questions that build on the information summarized in sections II.B and II.C above (and sections 3.1 through

3.3 of the PA) to more broadly address the extent to which the current evidence base supports the adequacy of the public health protection afforded by the current primary standard. The first question addresses the integrated consideration of the health effects evidence, in light of aspects described in sections II.A.1 and II.A.2 above. The second question focuses on consideration of associated areas of uncertainty. The third question then integrates consideration of the prior two questions with a focus on the standard, including each of the four elements. The PA considerations and conclusions with regard to these questions are summarized below.

In considering the extent to which information newly available in this review may have altered scientific support for the occurrence of health effects associated with Pb in ambient air, the PA concludes that the current evidence continues to support the EPA's conclusions from the previous review regarding key aspects of the health effects evidence for Pb and the health effects of multimedia exposure associated with levels of Pb occurring in ambient air in the U.S. (PA, section 4.2.1). The conclusions in this regard are based on consideration of the assessment of the currently available evidence in the ISA, particularly with regard to key aspects summarized in Chapter 3 of the PA, in light of the assessment of the evidence in the last review as described in the 2006 CD and summarized in the notice of final rulemaking (73 FR 66964, November 12, 2008). Key aspects of these conclusions are summarized below.

As at the time of the last review, blood Pb continues to be the predominant biomarker employed to assess exposure and health risk of Pb (ISA, Chapters 3 and 4), as discussed in section II.C above. This widely accepted role of blood Pb in assessing exposure and risk is illustrated by its established use in programs to prevent both occupational Pb poisoning and childhood Pb poisoning, with the latter program, implemented by the CDC, recently issuing updated guidance on blood Pb measurement interpretation (CDC, 2012). As in the past, the current evidence continues to indicate the close linkage of blood Pb levels in young children to their body burden; this linkage is associated with the ongoing bone remodeling during that lifestage (ISA, section 3.3.5). This tight linkage plays a role in the somewhat rapid response of children's blood Pb to changes in exposure (particularly to exposure increases), which contributes to its usefulness as an exposure biomarker (ISA, sections 3.2.2, 3.3.5, and 3.3.5.1). Additionally, the weight of evidence documenting relationships between children's blood Pb and health effects, most particularly those on the nervous and hematological systems (*e.g.*, ISA, sections 4.3 and 4.7), speaks to its usefulness in assessing health risk.

As in the last review, the evidence on air-to-blood relationships available today continues to be composed of studies based on an array of circumstances and population groups (of different age ranges), analyzed by a variety of techniques, which together contribute to appreciable variability in the associated quantitative estimates and uncertainty with regard to the relationships existing in the U.S. today. Accordingly, interpretation of this evidence base, as discussed in section II.C above, also includes consideration of factors that may be influencing various study estimates. We consider the study estimates in light of such factors both with regard to the extent to which the factors affect the usefulness of specific study estimates for the general purpose here of quantitatively characterizing relationships between Pb in ambient air and air-related Pb in children's blood and also with regard to the pertinence of such factors more specifically to conditions and populations in the U.S. today. As noted in the PA, the current evidence, while including two additional studies not available at the time of the last review, is not appreciably changed from that available in the last review (PA, section 3.1). The range of estimates that can be derived from the full dataset is broad and not changed by the inclusion of the newly available estimates. Further, the PA recognizes significant uncertainties regarding the air Pb to air-related blood Pb relationship for the current conditions where concentrations of Pb in both ambient air and children's blood are substantially lower than they have been in the past. In considering the strengths, limitations and uncertainties associated with the full dataset, the currently available evidence appears to continue to support a range of estimates for the purpose at hand that is generally consistent with the range given weight in the last review, 1:5 to 1:10 (ISA, section 3.7.4 and Table 3–12; 73 FR 67001–2, 67004, November 12, 2008). The PA additionally notes that the generally central estimate of 1:7 identified for this range in the last review is consistent with the study involving blood Pb for pre-school children and air Pb conditions near a large source of Pb to ambient air with concentrations near (and/or previously above) the level of the current Pb standard (ISA, section 3.5.1; Hilts, 2003).[63] In so noting, the PA also recognizes the general overlap of such circumstances with those represented by the evidence-based, air-related IQ loss framework,[64] for which air-to-blood ratio is a key input. In characterizing the range of air-to-blood ratio estimates, we recognize uncertainty inherent in such estimates as well as the variation in currently available estimates resulting from a variety of factors, including differences in the populations examined, as well as in the Pb sources or exposure pathways addressed in those study analyses (ISA, section 3.7.4).

The scientific evidence continues to recognize a broad array of health effects on multiple organ systems or biological processes related to blood Pb, including Pb in blood prenatally (ISA, section 1.6). The currently available evidence continues to support identification of neurocognitive effects in young children as the most sensitive endpoint associated with blood Pb concentrations (ISA, section 1.6.1), which as an integrated index of exposure reflects the aggregate exposure to all sources of Pb through multiple pathways (inhalation and ingestion). Evidence continues to indicate that some neurocognitive effects in young children may not be reversible and may have effects that persist into adulthood (ISA, section 1.9.5). Thus, as discussed in section II.B. above, the evidence of Pb effects at the low end of the studied blood Pb levels (closest to those common in the U.S. today) continues to be strongest and of greatest concern for effects on the nervous system, most particularly those on cognitive function in children.

As in the last review, evidence on risk factors continues to support the identification of young children as an important at-risk population for Pb health effects (ISA, section 5.4). The current evidence also continues to indicate important roles as factors that increase risk of Pb-related health effects for the following: Nutritional factors, such as iron and calcium intake; elevated blood Pb levels; and proximity to sources of Pb exposure, such as industrial releases or buildings with old,

[63] The older study by Hayes et al. (1994) during time of leaded gasoline indicated a generally similar ratio of 1:8, although the blood Pb levels in that study were much higher than those in the study by Hilts (2003). Among the studies focused on this age group, the latter study includes blood Pb levels closest to those in U.S. today.

[64] Concentrations near air sources are higher than those at more distant sites (as described in PA, section 2.2.2); it is near-source locations where there is the potential for concentrations at or near the current standard.

deteriorating, leaded paint. Further, some races or ethnic groups continue to demonstrate increased blood Pb levels relative to others, which may be related to these and other factors (ISA, sections 5.1, 5.2 and 5.4).

With regard to our understanding of the relationship between exposure or blood Pb levels in young children and neurocognitive effects, the PA notes that the evidence in this review, as in the last, does not establish a threshold blood Pb level for neurocognitive effects in young children (ISA, sections 1.9.4 and 4.3.12). The lowest blood Pb levels at which associations with neurocognitive impacts have been observed in pre-school and school age children continue to range down below 5 μg/dL, with the lowest group levels that have been associated with such effects ranging down to 2 μg/dL (ISA, sections 1.6.1 and 4.3.15.1). Additionally, as in the last review, there is evidence that the relationship of young children's blood Pb with neurocognitive impacts, such as IQ, is nonlinear across a wide range of blood Pb, with greater incremental impacts at lower versus higher blood Pb levels (ISA, sections 1.9.4 and 4.3.12). Accordingly, as in the last review, the PA focuses on C–R relationships from study groups with blood Pb levels closest to those in children in the U.S. today, which are generally lower than epidemiological study groups. The currently available evidence does not identify additional C–R slopes for study groups of young children (*e.g.*, ≤7 years) with mean blood Pb levels below that of groups identified in the last review, 2.9 − 3.8 μg/dL, as discussed in section II.B.3 above (ISA, section 4.3.12). Thus, the blood Pb concentration—IQ response functions or slopes identified in this review for epidemiological study groups of young children with mean blood Pb levels closest to that of children in the U.S. today include the same set recognized at the time of the last review (see Table 1 above), the median of which is 1.75 IQ points decrement per μg/dL blood Pb (73 FR 67003, November 12, 2008).

In considering the evidence with regard to the extent to which important uncertainties identified in the last review have been reduced or to which new uncertainties have emerged, as summarized in discussing the previous question and in section II.B above, the PA concludes that no new uncertainties were identified as emerging since the last review. However, the PA recognizes important uncertainties identified in the last review that remain today. Importantly, given our focus in this review, as in the last review, on neurocognitive impacts associated with Pb exposure in early childhood, the PA recognizes remaining uncertainties in our understanding of the C–R relationship of neurocognitive impacts, such as IQ decrements, with blood Pb level in young children, particularly across the range of blood Pb levels common in the U.S. today. With regard to C–R relationships for IQ, the evidence available in this review does not include studies that appreciably extend the range of blood Pb levels studied beyond those available in the last review. As in the last review, the early childhood (*e.g.*, 2 to 7 years of age) blood Pb levels for which associations with IQ response have been reported continue to extend at the low end of the range to study group mean blood Pb levels of 2.9 to 3.8 μg/dL (*e.g.*, 73 FR 67003, November 12, 2008, Table 3). The studies examining C–R relationships down to these blood Pb levels, as summarized in section II.B.3 above, continue to indicate higher C–R slopes in those groups with lower blood Pb levels than in study groups with higher blood Pb levels (ISA, section 4.3.12). The lack of studies considering C–R relationships for Pb effects on IQ at still lower blood Pb levels contributes to uncertainty regarding the quantitative relationship between blood Pb and IQ response in populations with mean blood Pb levels closer to the most recently available mean for children aged 1 to 5 years of age (*e.g.*, 1.17 μg/dL in 2009–2010 [ISA, p. 3–85]).

Further, the PA recognizes important uncertainties in our understanding of the relationship between ambient air Pb concentrations and air-related Pb in children's blood. The evidence newly available in this review has not reduced such key uncertainties. As in the last review, air-to-blood ratios based on the available evidence continue to vary, with our conclusions based on the current evidence generally consistent with the range of 1:5 to 1:10 given emphasis in the last review (73 FR 67002, November 12, 2008; ISA, section 3.7.4). There continues to be uncertainty regarding the extent to which this range represents the relationship between ambient air Pb and Pb in children's blood (derived from the full set of air-related exposure pathways) and with regard to its reflection of exposures associated with ambient air Pb levels common in the U.S. today and to circumstances reflecting just meeting the current Pb standard (ISA, section 3.7.4). The PA additionally notes the significant uncertainty remaining with regard to the temporal relationships of ambient Pb levels and associated exposure with occurrence of a health effect (73 FR 67005, November 12, 2008).

In integrating consideration of the prior two questions with a focus on the standard, the PA then addresses the question regarding the extent to which newly available information supports or calls into question any of the basic elements of the current Pb standard. The PA addresses this question for each of the elements of the standard in light of the health effects evidence and other relevant information available in this review (and summarized in sections II.B and II.C above). As an initial matter, the PA recognizes the weight of the scientific evidence available in this review that continues to support our focus on effects on the nervous system of young children, specifically neurocognitive decrements, as the most sensitive endpoint. Consistent with the evidence available in the last review, the currently available evidence continues to indicate that a standard that provides requisite public health protection against the occurrence of such effects in at-risk populations would also provide the requisite public health protection against the full array of health effects of Pb. Accordingly, the discussion of the elements below is framed by that background.

Indicator

The indicator for the current Pb standard is Pb-TSP. Key considerations in retaining this indicator in the last review are summarized in section II.A.1. Exposure to Pb in all sizes of particles passing through ambient air can contribute to Pb in blood and associated health effects by a wide array of exposure pathways (ISA, section 3.1). These pathways include the ingestion route, as well as inhalation (ISA, section 3.1), and a wide array of particle sizes play a role in these pathways (ISA, section 3.1.1.1). As at the time of the last review, the PA recognizes the variability of the Pb-TSP FRM in its capture of airborne Pb particles (as discussed in section 2.2.1.3.1 of the PA). As in the last review, the PA also notes that an alternative approach for collection of a conceptually comparable range of particle sizes, including ultra-coarse particles, is not yet available. Additionally, the limited available information regarding relationships between Pb-TSP and Pb in other size fractions indicates appreciable variation in this relationship, particularly near sources of Pb emissions where concentrations and potential exposures are greatest. Thus, the PA concludes that the information available in this review does not address previously

identified limitations and uncertainties for the current indicator. Nor does the newly available information identify additional limitations or uncertainties.

The PA notes that the evidence available in this review continues to indicate the role of a range of air Pb particle sizes in contributing to Pb exposure (*e.g.*, ISA, section 3.1.1.1) that contributes to Pb in blood and associated health effects. For example, the evidence indicates larger particle sizes for Pb that occurs in soil and house dust and may be ingested as compared to Pb particles commonly occurring in the atmosphere and the size fraction of the latter that may be inhaled (ISA, section 3.1.1.1). Taken together, the PA concludes that the evidence currently available reinforces the appropriateness of an indicator for the Pb standard that reflects a wide range of airborne Pb particles.

Averaging Time and Form

The averaging time and form of the standard were revised in the last Pb NAAQS review, based on considerations summarized in section II.A.1 above. The current standard is a not-to-be-exceeded rolling 3-month average (40 CFR 50.16), derived from three monthly averages calculated in accordance with the current data handling procedures (40 CFR part 50, Appendix R). The form is a maximum, evaluated within a 3-year period (40 CFR 50.16). As at the time of the last review, the PA notes that evidence continues to support the importance of periods on the order of 3 months and the prominent role of deposition-related exposure pathways, with uncertainty associated with characterization of precise time periods associating ambient air Pb with air-related health effects. The PA concludes that relevant factors continue to be those pertaining to the human physiological response to changes in Pb exposures and those pertaining to the response of air-related Pb exposure pathways to changes in airborne Pb. The PA concludes that the newly available evidence in this review does not appreciably improve our understanding of the period of time in which air Pb concentrations would lead to the health effects most at issue in this review (PA, section 4.2.1). Newly available evidence accordingly also does not appreciably improve our understanding of the period of time for which control of air Pb concentrations would protect against exposures most pertinent to the health effects most at issue in this review. Thus, while there continue to be limitations in the evidence to inform our consideration of these elements of the standard and associated uncertainty, the available evidence continues to provide support for the decisions made in the last review regarding these elements of the current Pb standard.

Level

The level of the current standard is 0.15 μg/m³ (40 CFR 50.16). As described in section II.A.1 above, this level was selected in 2008 with consideration of, among other factors, an evidence-based air-related IQ loss framework, for which there are two primary inputs: Air-to-blood ratios and C–R functions for blood Pb–IQ response in young children. Additionally taken into consideration were the uncertainties inherent in these inputs.[65] Application of the framework also entailed consideration of a magnitude of air-related IQ loss, which as further described in section II.A.1 above, is used in conjunction with this specific framework in light of the framework context, limitations and uncertainties. Additionally, selection of a level for the standard in 2008 was made in conjunction with decisions on indicator, averaging time and form.

As an initial matter, the PA considers the extent to which the evidence-based, air-related IQ loss framework which informed the Administrator's decision in the last review is supported by the currently available evidence and information. In so doing, the PA recognizes the support provided by the currently available evidence for the key conclusions drawn in the last review with regard to health effects of greatest concern, at-risk populations, the influence of Pb in ambient air on Pb in children's blood and the association between children's blood Pb and decrements in neurocognitive function (*e.g.*, IQ). The PA additionally notes the complexity associated with interpreting the scientific evidence with regard to specific levels of Pb in ambient air, given the focus of the evidence on blood Pb as the key biomarker of children's aggregate exposure. The need to make such interpretations in the face of the associated complexity supported use of the evidence-based framework in the last review. In considering the currently available evidence for the same purposes in this review, the PA concludes that the evidence-based framework continues to provide a useful tool for consideration of the evidence with regard to the level of the standard.

The PA next turned to consideration of the primary inputs to the framework: Air-to-blood ratios and C–R functions for blood Pb–IQ response in young children. With regard to the former, the PA concludes the limited newly available information assessed in the ISA, and discussed in section II.C above, to be generally consistent with the information in this area that was available at the time of the last review. The PA additionally recognizes the variability and uncertainty associated with quantitative air-to-blood ratios based on this information, as also existed in the last review. As in the last review, factors contributing to the variability and uncertainty of these estimates are varied and include aspects of the study populations (*e.g.*, age and Pb exposure pathways) and the study circumstances (*e.g.*, length of study period and variations in sources of Pb exposure during the study period). The PA notes that the full range of estimates associated with the available evidence is wide and considers it appropriate to give emphasis to estimates pertaining to circumstances closest to those in the U.S. today with regard to ambient air Pb and children's blood Pb concentrations, while recognizing the limitations associated with the available information. With that in mind, the PA considers the currently available evidence to continue to support the range of estimates for air-to-blood ratios concluded in the last review to be most appropriate for the current population of young children in the U.S., in light of the multiple air-related exposure pathways by which children are exposed and of the levels of air and blood Pb common today. Identification of this range also included consideration of the limitations associated with the available information and inherent uncertainties. This range of air-to-blood ratios included 1:10 at the upper end and 1:5 at the lower end. The PA further recognizes that the limited evidence for air Pb and children's blood Pb concentrations closest to those in U.S. today continues to provide support for the Administrator's emphasis in the 2008 decision on the relatively central estimate of 1:7.

With regard to the second input to the evidence-based framework, C–R functions for the relationship of young children's blood Pb with neurocognitive impacts (*e.g.*, IQ decrements), the PA considers several aspects of the evidence. First, as discussed in section II.B.3 above, the currently available information continues to provide evidence that this C–R relationship is nonlinear across the range of blood Pb levels from the higher concentrations

[65] As discussed further below, the Administrator also considered the exposure/risk-based information, which he found to be roughly consistent and generally supportive of the framework estimates (73 FR 67004).

more prevalent in the past to lower concentrations more common today. Thus, the PA continues to consider it particularly appropriate to focus on the evidence from studies with blood Pb levels closest to those of today's population which, as in the last review, includes studies with study group mean blood Pb levels ranging roughly from 3 to 4 μg/dL in children aged 24 months to 7 years (PA, Table 3–3). As discussed in section II.B.3 above, this is also consistent with the evidence currently available for this age group of young children, which does not include additional C–R slopes for incremental neurocognitive decrement with blood Pb levels at or below this range. In considering whether this set of functions continues to be well supported by the evidence, as assessed in the ISA (ISA, section 4.3.2), the PA notes the somewhat wide range in slopes encompassed by these study groups, while also noting the stability of the median. For example, omission of any of the four slopes considered in the last review does not appreciably change the median (*e.g.*, the median would change from −1.75 IQ points per μg/dL blood Pb to −1.71 or −1.79). Thus, while differing judgments might be made with regard to inclusion of each of the four study groups, these estimates are generally supported by the current review of the evidence in the ISA. Further, the stability of the median to modifications to this limited dataset lead the PA to conclude that the currently available evidence continues to support consideration of −1.75 IQ points per μg/dL blood Pb as a well-founded and stable estimate for purposes of describing the neurocognitive impact quantitatively on this age group of U.S. children.

In summary, in considering the evidence and information available in this review pertaining to the level of the current Pb standard, the PA notes that the evidence available in this review, as summarized in the ISA, continues to support the air-related IQ loss evidence-based framework, with the inputs that were used in the last review. These include estimates of air-to-blood ratios ranging from 1:5 to 1:10, with a generally central estimate of 1:7. Additionally, the C–R functions most relevant to blood Pb levels in U.S. children today continue to be provided by the set of four analyses considered in the last review for which the median estimate is −1.75 IQ points per μg/dL Pb in young children's blood. Thus, the PA observed that the evidence available in this review has changed little if at all with regard to the aspects given weight in the conclusion on level for the new standard in the last review and would not appear to call into question any of the basic elements of the standard. In so doing, the PA additionally recognizes that the overall decision on adequacy of the current standard is a public health policy judgment by the Administrator.

2. Exposure/Risk-Based Considerations in the Policy Assessment

In consideration of the issue of adequacy of public health protection provided by the current standard, the PA also considered the quantitative exposure/risk assessment completed in the last review, augmented as described in section II.C above. The PA recognizes substantial uncertainty inherent in the REA estimates of air-related risk associated with localized conditions just meeting the current standard, which we have characterized as approximate and falling within rough bounds.[66] This approximate estimate of risk for children living in such areas is generally overlapping with and consistent with the evidence-based air-related IQ loss estimates described in section II.A.1 above. The PA discussion with regard to interpretation of the exposure/risk information for air quality conditions associated with just meeting the current standard is organized around two questions, as summarized here (PA, section 4.2.2).

In considering the level of confidence associated with estimates of air-related risk generated for simulations just meeting the current Pb standard, the PA recognizes, as an initial matter, the significant limitations and complexity associated with the risk and exposure assessments for Pb that are far beyond those associated with similar assessments typically performed for other criteria pollutants. In completing the assessment, we were constrained by significant limitations with regard to data and tools particular to the problem at hand. Further, the multimedia and persistent nature of Pb and the role of multiple exposure pathways contribute significant additional complexity to the assessment as compared to other assessments that focus only on the inhalation pathway. As a result, the estimates of air-related exposure and risk are approximate, presented as upper and lower bounds within which we consider air-related risk likely to fall. The description of overall confidence in this characterization of air-related risk is based on consideration of the overall design of the analysis (summarized in section II.D), the degree to which key sources of variability are reflected in the design of the analysis (summarized in section II.D.3), and our characterization of key sources of uncertainty (summarized in section II.D.3).

With regard to key sources of uncertainty, the PA notes particularly those affecting the precision of the air-related risk estimates. Associated sources of uncertainty include the inability to simulate changes in air-related Pb as a function of changes in ambient air Pb in exposure pathways other than those involving inhalation of ambient air and ingestion of indoor dust. This contributes to the positive bias of the upper bound for the air-related risk estimates. The PA additionally recognizes the significant uncertainty associated with estimating upper percentiles of the distribution of *air-related* blood Pb concentration estimates (and associated IQ loss estimates) due to limitations in available information. Lastly, the PA recognizes the uncertainty associated with application of the C–R function at the lower blood Pb levels in the distribution; this relates to the limited representation of blood Pb levels of this magnitude in the dataset from which the C–R function is derived (PA, section 4.2.2).

In the quantitative risk information available in this review, we have air-related risk estimates for simulations just meeting the current standard from one of the location-specific urban case studies (Chicago) and from the generalized (local) urban case study. With regard to the latter, the PA notes its simplified design that does not include multiple exposure zones; thus reducing the dimensions simulated. The PA concludes a reasonable degree of confidence in aspects of the generalized (local) urban case study for the specific situation we consider it to represent (*i.e.*, a temporal pattern of air Pb concentrations that just meets the level of the standard), and when the associated estimates are characterized as approximate, within upper and lower bounds (as described above), while also recognizing considerable associated uncertainty.

In considering the extent to which the estimated air-related risks remaining upon just meeting the current Pb standard are important from a public health perspective, the PA considers the nature and magnitude of such estimated risks (and attendant uncertainties), including such impacts on the affected

[66] We note that the value of the upper bound is influenced by risk associated with exposure pathways that were not varied with alternative standard levels, a modeling limitation with the potential to contribute to overestimation of the upper bound with air quality scenarios involving air Pb levels below current conditions for the study area (see sections 3.4.4 and 3.4.7 above).

population, and additionally considers the size of the affected population. In considering the quantitative risk estimates for decrements in IQ, we recognize that although some neurocognitive effects may be transient, some effects may persist into adulthood, affecting success later in life (ISA, sections 1.9.5 and 4.3.14). The PA additionally recognizes the potential population impacts of small changes in population mean values of metrics such as IQ, presuming a uniform manifestation of Pb-related decrement across the range of population IQ (ISA, section 1.9.1; PA, section 3.3).

As summarized in sections II.D above, limitations in modeling tools and data affected our ability to develop precise risk estimates for air-related Pb exposure pathways and contributed uncertainties to the risk estimates. The results are approximate estimates which we describe through the use of rough upper and lower bounds within which we estimate air-related risk to fall. We have recognized a number of uncertainties in the underlying risk estimates from the 2007 REA and in the interpolation approach employed in the new analyses for this review. We have characterized the magnitude of air-related risk associated with the current standard with a focus on median estimates, for which we have appreciably greater confidence than estimates for outer ends of risk distribution (see section 3.4.7 of the PA) and on risks derived using the C–R function in which we have greatest confidence (see sections 3.4.3.3.1 and 3.4.7 of the PA). These risk estimates include estimates from the last review for one of the location-specific urban study area populations as well as estimates newly derived in this review based on interpolation from 2007 REA results for the generalized (local) urban case study, which is recognized to reflect a generalized high end of air-related exposure for localized populations. Taken together, these results for just meeting the current standard include a high-end localized risk estimate for air-related Pb of a magnitude falling within general rough bounds of 1 and 3 points IQ loss, with attendant uncertainties, and with appreciably lower risks with increasing distance from the highest exposure locations.

In considering the importance of such risk from a public health perspective, the PA also considers the size of at-risk populations represented by the REA case studies. As summarized in section II.D.1 above (and described more fully in the PA, section 3.4), the generalized (local) urban case study is considered to represent a localized urban population exposed near the level of the standard, such as a very small, compact neighborhood near a source contributing to air Pb concentrations just meeting the standard. This case study provides representation in the risk assessment for such small populations at the upper end of the gradient in ambient air concentrations expected to occur near sources; thus estimates for this case study reflect exposures nearest the standard being evaluated. While we do not have precise estimates of the number of young children living in such areas of the U.S. today, we have information that informs our understanding of their magnitude. For example, as summarized in section II.B.5 above, the PA estimates some 2,700 children, aged 5 years and younger, to be living in localized areas with elevated air Pb concentrations that are above or near the current standard. Based on the 2010 census estimates of approximately 24.3 million children in the U.S. aged 5 years or younger, this indicates the size of the population of young children of this age living in areas in close proximity to areas where air Pb concentrations may be above or near the current standard to be generally on the order of a hundredth of a percent of the full population of correspondingly aged children.[67] [68] While these estimates pertain to the age group of children aged 5 years and younger, the PA additionally notes that a focus on an alternative age range (*e.g.*, through age 7), while increasing the number for children living in such locations, would not be expected to appreciably change the percentage of the full U.S. age group that the subset represents.

3. CASAC Advice

In the current review of the primary standard for Pb, the CASAC has provided advice and recommendations in their review of drafts of the ISA, of the REA Planning Document, and of the draft PA. We have additionally received comments from the public on drafts of these documents.[69]

In their comments on the draft PA, the CASAC concurred with staff's overall preliminary conclusions that it is appropriate to consider retaining the current primary standard without revision, stating that "the current scientific literature does not support a revision to the Primary Lead (Pb) National Ambient Air Quality Standard (NAAQS)" (Frey, 2013b). They further noted that "[a]lthough the current review incorporates a substantial body of new scientific literature, the new literature does not justify a revision to the standards because it does not significantly reduce substantial data gaps and uncertainties (*e.g.*, air-blood Pb relationship at low levels; sources contributing to current population blood Pb levels, especially in children; the relationship between Pb and childhood neurocognitive function at current population exposure levels; the relationship between ambient air Pb and outdoor dust and surface soil Pb concentrations)." In recognition of these limitations in the available information, the CASAC provided recommendations on research to address these data gaps and uncertainties so as to inform future Pb NAAQS reviews (Frey, 2013b).

The CASAC comments indicated agreements with key aspects of staff's consideration of the exposure/risk information and currently available evidence in this review (Frey, 2013b, Consensus Response to Charge Questions, p. 7).

The use of exposure/risk information from the previous Pb NAAQS review appears appropriate given the absence of significant new information that could fundamentally change the interpretation of the exposure/risk information. This interpretation is reasonable given that information supporting the current standard is largely unchanged since the current standard was issued.

The CASAC agrees that the adverse impact of low levels of Pb exposure on neurocognitive function and development in children remains the most sensitive health endpoint, and that a primary Pb NAAQS designed to protect against that effect will offer satisfactory protection against the many other health impacts associated with Pb exposure.

The CASAC concurs with the draft PA that the scientific findings pertaining to air-to-blood Pb ratios and the C–R relationships between blood Pb and childhood IQ decrements that formed the basis of the current Pb NAAQS remain valid and are consistent with current data.

[67] The areas included in this estimate where the standard is currently exceeded are treated, for present purposes, as areas with air Pb concentrations just meeting the current standard and are included for purposes of this analysis (PA, pp. 3–36 to 3–38). This is in light of the requirement for areas not in attainment with the standard to attain the standard as expeditiously as practicable, but no later than 5 years after designation.

[68] A second PA analysis, performed in recognition of the potential for the first analysis to under-represent sites with elevated Pb concentrations, but with its own attendant uncertainties, indicates the potential for the population group in such areas to be only slightly larger, in terms of hundredths of a percent of the full population of children in this age group (PA, pp. 3–36 to 3–38, 4–25, 4–32).

[69] As noted in section II.E.3 above, written comments submitted to the agency, as well as transcripts and minutes of the public meetings held in conjunction with CASAC's reviews of documents for the review will be available in the docket for this rulemaking.

The CASAC concurred with the appropriateness of the application of the evidence-based framework from the last Pb NAAQS review. Witb regard to the key inputs to that framework, CASAC concluded that "[t]he new literature published since the previous review provides further support for the health effect conclusions presented in that review" and that the studies newly available in this review "do not fundamentally alter the uncertainties for air-to-blood ratios or C–R functions for IQ decrements in young children" (Frey, 2013b, Consensus Response to Charge Questions, p. 6).

The comments from CASAC also took note of the uncertainties that remain in this review, which contribute to the uncertainties associated with drawing conclusions regarding air-related exposures and associated health risk at or below the level of the current standard, stating their agreement with "the EPA conclusion that 'there is appreciable uncertainty associated with drawing conclusions regarding whether there would be reductions in blood Pb levels from alternative lower levels as compared to tbe level of tbe current standard'" (Frey, 2013b, Consensus Response to Charge Questions, p. 6).

Of the limited public comments received on this review to date that have addressed adequacy of the current primary Pb standard, all but one state support for retaining the current standard without revision, citing uncertainties in the available evidence and risk information. Tbe other commenter expressed the view that the standard should be revised to be more restrictive given the evidence of Pb effects in populations witb mean blood Pb levels below 10 µg/dL.

4. Administrator's Proposed Conclusions on the Adequacy of the Current Primary Standard

Based on the large body of evidence concerning the health effects and potential public healtb impacts of exposure to Pb emitted into ambient air, and taking into consideration tbe attendant uncertainties and limitations of the evidence, the Administrator proposes to conclude that the current primary standard provides the requisite protection of public health, with an adequate margin of safety and should be retained.

In considering the adequacy of the current standard, the Administrator has carefully considered the assessment of the available evidence and conclusions contained in the ISA; the technical information, including exposure/risk information, staff conclusions, and associated rationale, presented in the PA; the advice and recommendations from CASAC; and public comments to date in this review. In the discussion below, the Administrator gives weight to the PA conclusions, with which CASAC has concurred, and takes note of key aspects of the rationale presented for those conclusions which contribute to her proposed decision.

As an initial matter, the Administrator takes note of the PA discussion with regard to the complexity involved in considering the adequacy of protection in tbe case of the primary Pb standard, which differs substantially from that involved in consideration of the primary NAAQS for other pollutants, for whicb the limited focus on the inhalation pathway is a relatively simpler context. Additionally, while an important component of the evidence bese for most other NAAQS pollutants is the availability of studies that have investigated an association between current concentrations of the pollutant in ambient air and the occurrence of health effects plausibly related to ambient air exposure to that pollutant, the evidence base that supports conclusions in this review of the Pb NAAQS includes most prominently epidemiological studies focused on associations of blood Pb levels in U.S. populations with health effects plausibly related to Pb exposures. Support for conclusions regarding the plausibility for ambient air Pb to play a role in such findings derives, in part, from studies linking Pb in ambient air witb the occurrence of health effects. However, such studies (dating from the past or from other countries) involve ambient air Pb concentrations many times greater than those that would meet the current standard. Thus, in considering the adequacy of the current Pb standard, rather than considering studies that have directly investigated current concentrations of Pb in ambient air (including in locations where the current standard is met) and the occurrence of health effects, we primarily consider the evidence for, and risk estimated from, models, based upon key relationships, such as those among ambient air Pb, Pb exposure, blood Pb and bealth effects. This evidence, with its associated limitations and uncertainties, contributes to the EPA's conclusions regarding a relationship between ambient air Pb conditions under the current standard and health effects.

With regard to the current evidence, the Administrator first takes note of the well-established body of evidence on the health effects of Pb, augmented in some aspects since the last review, whicb continues to support identification of neurocognitive effects in young children as the most sensitive endpoint associated with Pb exposure. The evidence, as summarized in the PA and discussed in detail in the ISA, continues to indicate that a standard that provides protection from neurocognitive effects in young children additionally provides protection for other health effects of Ph, such as those reported in adult populations. The Administrator takes note of the PA finding that application of the evidence-besed, air-related IQ loss framework, developed in the last review, continues to provide a useful approach for considering and integrating the evidence on relationships between Pb in ambient air and Pb in children's blood and risks of neurocognitive effects (for which IQ loss is used as an indicator). She additionally takes note of the PA finding (described in section II.E.1 above) that the currently available evidence bese, while somewhat expanded since the last review, is not appreciably expanded or supportive of appreciably different conclusions with regard to air-to-blood ratios or C–R functions for neurocognitive decrements in young children. She concurs with the PA findings, summarized in section II.E.1 above, that application of this framework, in light of the current evidence and exposure/risk information, continues to support a standard as protective as the current standard.

In considering the nature and magnitude of the array of uncertainties that are inherent in the scientific evidence and analyses, the Administrator recognizes that our understanding of the relationships between the presence of a pollutant in ambient air and associated health effects is based on a broad body of information encompassing not only more established aspects of the evidence, but also aspects in which there may be substantial uncertainty. In the case of the Pb NAAQS review, she takes note of the recognition in the PA of increased uncertainty in characterizing the relationship of effects on IQ with blood Pb levels below those represented in the evidence bese and in projecting the magnitude of blood Pb response to ambient air Pb concentrations at and below the level of the current standard. The PA recognizes this increased uncertainty, particularly in light of the multiple factors that play a role in such a projection (*e.g.*, meteorology, atmospheric dispersion and deposition, buman physiology and behavior), each of which carry attendant uncertainties. The Administrator recognizes that collectively, these aspects of the

evidence and associated uncertainties contribute to a recognition that for Pb, as for other pollutants, the available health effects evidence generally reflects a continuum, consisting of levels at which scientists generally agree that health effects are likely to occur, through lower levels at which the likelihood and magnitude of the response become increasingly uncertain.

In making a judgment on the point at which health effects associated with Pb become important from a public health perspective, the Administrator has considered the public health significance of a decrement of a very small number of IQ points in the at-risk population of young children, in light of associated uncertainties. She notes that her judgment on this matter relates to her consideration of the IQ loss estimates yielded by the air-related IQ loss evidence-based framework for specific combinations of standard level, air-to-blood ratio and C–R function. In considering the public health significance of IQ loss estimates in young children, the Administrator gives weight to the comments of CASAC and some public commenters in the last review which recognized a population mean IQ loss of 1 to 2 points to be of public health significance and recommended that a very high percentage of the population be protected from such a magnitude of IQ loss (73 FR 67000, November 12, 2008). In so doing, the Administrator additionally notes that the EPA is aware of no new information or new commonly accepted guidelines or criteria within the public health community for interpreting public health significance of neurocognitive effects in the context of a decision on adequacy of the current Pb standard (PA, pp. 4–33 to 4–34).

With the objective identified by CASAC in the 2008 review in mind, the Administrator considers the role of the air-related IQ loss evidence-besed framework in informing consideration of standards that might be concluded to provide such a level of protection. In so doing, she first recognizes, like the Administrator at the time of the last review, that the IQ loss estimates produced with the evidence-based framework do not correspond to a specific quantitative public health policy goal for air-related IQ loss that would be acceptable or unacceptable for the entire population of children in the U.S. Rather, the conceptual context for the evidence-besed framework is that it provides estimates for the mean air-related IQ loss of a subset of the population of U.S. children (*i.e.*, the subset living in close proximity to air Pb sources that contributed to elevated air Pb concentrations that equal the current level of the standard). This is the subset expected to experience air-related Pb exposures at the high end of the national distribution of such exposures. The associated mean IQ loss estimate is the average for this highly exposed subset and is not the average air-related IQ loss projected for the entire U.S. population of children. Further, the Administrator recognizes uncertainties associated with those estimates, and notes the PA conclusion that the uncertainties increase with estimates associated with successively lower standard levels. The Administrator additionally takes note of the PA estimates for the size of such a population, drawn from information on numbers of young children (aged 5 years or younger) living near monitors registering ambient Pb concentrations above or within 10 percent of the NAAQS, which indicate it to be on the order of one hundredth of one percent of the U.S. population of children of this age, with an upper bound of approximately four hundredths of one percent, drawn from similar demographic information based on proximity to large Pb sources, as identified using the NEI (PA, pp. 3–36 to 3–38). In summary, the current evidence, as considered within the conceptual and quantitative context of the evidence-besed framework, and current air monitoring information indicates that the current standard would be expected to satisfy the public health policy goal recommended by CASAC in the last Pb NAAQS review, and CASAC did not provide a different goal in the present review. Thus, the evidence indicates that the current standard provides protection for young children from neurocognitive impacts, including IQ loss, consistent with advice from CASAC regarding IQ loss of public health significance.

In drawing conclusions from application of the evidence-based framework with regard to adequacy of the current standard, the Administrator further recognizes the degree to which IQ loss estimates drawn from the air-related IQ loss evidence-based framework reflect mean blood Pb levels that are below those represented in the currently available evidence for young children. For example, in the case of the current standard level of 0.15 µg/m³, multiplication by the air-to-blood ratio of 1:7, the value that was the focus of the last review and which the evidence continues to support in this review, yields a mean air-related blood Pb level of 1.05 µg/dL. This blood Pb level is half the level of the lowest blood Pb subgroup of pre-school children in which neurocognitive effects have been observed (PA, Table 3–2; Miranda et al., 2009) and well below the means of subgroups for which continuous C–R functions have been estimated (Table 1 above). The Administrator views such an extension below the lowest studied levels to be reasonable given the lack of identified blood Pb level threshold in the current evidence base for neurocognitive effects and the need for the NAAQS to provide a margin of safety. She takes note, however, of the PA finding that the framework IQ loss estimates for standard levels lower than the current standard level represent still greater extrapolations from the current evidence base with corresponding increased uncertainty (PA, section 3.2, pp. 4–32 to 4–33).

In considering application of the evidence-besed framework in this review with regard to the extent there is support within the evidence for a standard with greater protection, the Administrator additionally takes note of the uncertainties that remain in our understanding of important aspects of ambient air Pb exposure and associated health effects, as discussed in the PA (PA, Chapter 3) and summarized in sections II.B and II.C above. With regard to the air-to-blood ratios that reflect the relationship between concentrations of Pb in ambient air and air-related Pb in children's blood, she particularly notes the limitations and uncertainties identified in the ISA and PA with regard to the available studies and the gaps and uncertainties in the evidence base. These include gaps and uncertainties with regard to studies that have investigsted such quantitative relationships under conditions pertaining to the current standard (*e.g.*, in localized areas near air Pb sources where the standard is just met in the U.S. today), as well as with regard to evidence to inform our understanding of the quantitative aspects of relationships between ambient air Pb and outdoor soil/dust Ph and indoor dust Pb. These critical exposure pathways are also represented in the evidence-based air-related IQ loss framework within the estimates of air-to-blood ratios. In light of these uncertainties and limitations in the evidence base, the Administrator gives weight to the PA conclusion of greater uncertainty with regard to relationships between concentrations of Pb in ambient air and air-related Pb in children's blood, and with ragard to estimates of the slope of the C–R function of neurocognitive impacts (IQ loss) for application of the framework to levels below the current standard, given the weaker linkage with existing evidence as discussed in the PA (PA, sections 3.1, 3.2 and 4.2.1).

With respect to exposure/risk-based considerations, as in the last review, the Administrator notes the complexity of the REA modeling analyses and the associated limitations and uncertainties. Based on consideration of the risk-related information for conditions just meeting the current standard, the Administrator takes note of the attendant uncertainties, discussed in detail in the PA (PA, sections 3.4 and 4.2.2), while finding that the quantitative risk estimates, with a focus on those for the generalized (local) urban case study, are "roughly consistent with and generally supportive" of estimates from the evidence-based air-related IQ loss framework. She further takes note of the PA finding of increasing uncertainty for air quality scenarios involving air Pb concentrations increasingly below the current conditions for each case study, due in part to modeling limitations that derive from uncertainty regarding relationships between ambient air Pb and outdoor soil/dust Pb and indoor dust Pb (PA, sections 3.4.3.1 and 3.4.7).

Based on the above considerations and with consideration of advice from CASAC, the Administrator reaches the conclusion that the current body of evidence, in combination with the exposure/risk information, supports a primary standard as protective as the current standard. Based on consideration of the evidence and exposure/risk information available in this review with its attendant uncertainties and limitations and information that might inform public health policy judgments, as well as advice from CASAC, including their concurrence with the PA conclusions that revision of the primary Pb standard is not warranted at this time, the Administrator further concludes that it is appropriate to consider retaining the current standard without revision.

The Administrator bases these proposed conclusions on consideration of the health effects evidence, including consideration of this evidence in the context of the evidence-based, air-related IQ loss framework, and with support from the exposure/risk information, recognizing the uncertainties attendant with both. In so doing, she takes note of the PA description of the complexities and limitations in the evidence base associated with reaching conclusions regarding the magnitude of risk associated with the current standard, as well as the increasing uncertainty of risk estimates for lower air Pb concentrations. Inherent in the Administrator's conclusions are public health policy judgments on the public health implications of the blood Pb levels and risk estimated for air-related Pb under the current standard, including the public health significance of the Pb effects being considered, as well as aspects of the use of the evidence-based framework that may be considered to contribute to the margin of safety. These public health policy judgments include judgments related to the appropriate degree of public health protection that should be afforded to protect against risk of neurocognitive effects in at-risk populations, such as IQ loss in young children, as well as with regard to the appropriate weight to be given to differing aspects of the evidence and exposure/risk information, and how to consider their associated uncertainties. Based on these considerations and the judgments identified here, the Administrator concludes that the current standard provides the requisite protection of public health with an adequate margin of safety, including protection of at-risk populations, such as young children living near Pb emissions sources where ambient concentrations just meet the standard.

In reaching this conclusion with regard to the adequacy of public health protection afforded by the existing primary standard, the Administrator recognizes that in establishing primary standards under the Act that are requisite to protect public health with an adequate margin of safety, she is seeking to establish standards that are neither more nor less stringent than necessary for this purpose. The Act does not require that primary standards be set at a zero-risk level, but rather at a level that avoids unacceptable risks to public health, even if the risk is not precisely identified as to nature or degree. The CAA requirement that primary standards provide an adequate margin of safety was intended to address uncertainties associated with inconclusive scientific and technical information available at the time of standard setting, as described in section I.A above. This requirement was also intended to provide a reasonable degree of protection from hazards that research has not yet identified.

In this context, the Administrator's proposed conclusion that the current standard provides the requisite protection and that a more restrictive standard would not be requisite additionally recognizes that the uncertainties and limitations associated with the many aspects of the estimated relationships between air Pb concentrations and blood Pb levels and associated health effects are amplified with consideration of increasingly lower air concentrations. In so doing, she takes note of the PA conclusion, with which CASAC has agreed, that based on the current evidence, there is appreciable uncertainty associated with drawing conclusions regarding whether there would be reductions in blood Pb levels and risk to public health from alternative lower levels of the standard as compared to the level of the current standard (PA, pp. 4–35 to 4–36; Frey, 2013b, p. 6). The Administrator judges this uncertainty to be too great for the current evidence and exposure/risk information to provide a basis for revising the current standard. Thus, based on the public health policy judgments described above, including the weight given to uncertainties in the evidence, the Administrator proposes to conclude that the current standard should be retained, without revision. The Administrator solicits comment on this conclusion.

III. Rationale for Proposed Decision on the Secondary Standard

This section presents information relevant to the rationale for the Administrator's proposed decision to retain the existing secondary Pb standard, which as discussed more fully below, is based on a thorough review in the ISA of the latest scientific information, generally published through September 2011,[70] on ecological or welfare effects associated with Pb and pertaining to the presence of Pb in the ambient air. This proposal also takes into account: (1) The PA's staff assessments of the most policy-relevant information in the ISA and staff analyses of potential ecological exposures and risk, upon which staff conclusions regarding appropriate considerations in this review are based; (2) CASAC advice and recommendations, as reflected in discussions of drafts of the ISA and PA at public meetings, in separate written comments, and in CASAC's letters to the Administrator; and (3) public comments received during the development of these documents, either in connection with CASAC meetings or separately.

[70] In addition to the review's opening "call for information" (75 FR 8934), "literature searches were conducted routinely to identify studies published since the last review, focusing on studies published from 2006 (close of the previous scientific assessment) through September 2011" and references "that were considered for inclusion or actually cited in this ISA can be found at *http://hero.epa.gov/lead*" (ISA, p. 1–2).

Section III.A provides background on the general approach for review of the secondary NAAQS for Pb, including a summary of the approach used in the last review (section III.A.1) and the general approach for the current review (section III.A.2). Section III.B summarizes the body of evidence on ecological or welfare effects associated with Pb exposures, focusing on consideration of key policy-relevant questions, and section III.C summarizes the exposure/risk information in this review. Section III.D presents the Administrator's proposed conclusions on adequacy of the current standard, drawing on both evidence-based and exposure/risk-based considerations (sections III.D.1), and advice from CASAC (section III.D.2).

A. General Approach

The past and current approaches described below are all based most fundamentally on using the EPA's assessment of the current scientific evidence and previous quantitative analyses to inform the Administrator's judgment with regard to the secondary standard for Pb. In drawing conclusions for the Administrator's consideration with regard to the secondary standard, we note that the final decision on the adequacy of the current secondary Pb standard is largely a public welfare policy judgment to be made by the Administrator. The Administrator's final decision must draw upon scientific information and analyses about welfare effects, exposure and risks, as well as judgments about the appropriate response to the range of uncertainties that are inherent in the scientific evidence and analyses. This approach is consistent with the requirements of the NAAQS provisions of the Act. These provisions require the Administrator to establish a secondary standard that, in the judgment of the Administrator, is "requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of the pollutant in the ambient air." In so doing, the Administrator seeks to establish standards that are neither more nor less stringent than necessary for this purpose.

1. Approach in the Last Review

In the last review, completed in 2008, the current secondary standard for Pb was set equal to the primary standard (73 FR 66964, November 12, 2008). As summarized in sections I.C and II.A.1 above, the primary standard was substantially revised in the last review. The 2008 decision considered the body of evidence as assessed in the 2006 CD (USEPA, 2006a) as well as the 2007 Staff Paper assessment of the policy-relevant information contained in the 2006 CD and the screening-level ecological risk assessment (2006 REA; USEPA, 2007b), the advice and recommendations of CASAC (Henderson 2007a, 2007b, 2008a, 2008b), and public comment.

In the previous review, the Staff Paper concluded, based on laboratory studies and current media concentrations in a wide range of locations, that it seemed likely that adverse effects were occurring from ambient air-related Pb, particularly near point sources, under the then-current standard (73 FR 67010, November 12, 2008). Given the limited data on Pb effects in ecosystems, and associated uncertainties, such as those with regard to factors such as the presence of multiple metals and historic environmental burdens, it was at the time, as it is now, necessary to look at evidence of Pb effects on organisms and extrapolate to ecosystem effects. Taking into account the available evidence and current media concentrations in a wide range of locations, the Administrator concluded that there was potential for adverse effects occurring under the then-current standard; however there were insufficient data to provide a quantitative basis for setting a secondary standard different from the primary (73 FR 67011, November 12, 2008). Therefore, citing a general lack of data that would indicate the appropriate level of Pb in environmental media that may be associated with adverse effects, as well as the comments of the CASAC Pb panel that a significant change to current air concentrations (*e.g.*, via a significant change to the standard) was likely to have significant beneficial effects on the magnitude of Pb exposures in the environment, the secondary standard was revised to be consistent with the revised primary standard (73 FR 67011, November 12, 2008).

2. Approach for the Current Review

Our approach for reviewing the current secondary standard takes into consideration the approaches used in the last Pb NAAQS review and involves addressing key policy-relevant questions in light of currently available scientific and technical information. In evaluating whether it is appropriate to consider retaining the current secondary Pb standard, or whether consideration of revision is appropriate, we have adopted an approach in this review that builds on the general approach from the last review and reflects the body of evidence and information now available. As summarized above, the Administrator's decisions in the previous review were based on the conclusion that there was the potential for adverse ecological effects under the previous standard.

In our approach here, we focus on consideration of the extent to which a broader body of scientific evidence is now available that would inform decisions on either the potential for adverse effects to ecosystems under the current standard or the ability to set a more ecologically relevant secondary standard than was feasible in the previous review. In considering the scientific and technical information in sections II.B and II.C below, as in the PA, we draw on the ecological effects evidence presented in detail in the ISA and aspects summarized in the PA, along with the information associated with the screening-level risk assessment also in the PA. In section III.D below, we have taken into account both evidence-based and risk-based considerations framed by a series of policy-relevant questions presented in the PA. These questions generally discuss the extent to which we are able to better characterize effects and the likelihood of adverse effects in the environment under the current standard. Our approach to considering these issues recognizes that the available welfare effects evidence generally reflects laboratory-based evidence of toxicological effects on specific organisms exposed to concentrations of Pb. It is widely recognized, however, that environmental exposures from atmospherically derived Pb are likely to be lower than those commonly assessed in laboratory studies and that studies of exposures similar to those in the environment are often accompanied by significant confounding and modifying factors (*e.g.*, other metals, acidification), increasing our uncertainty about the likelihood and magnitude of organism and ecosystem responses.

B. Welfare Effects Information

Welfare effects addressed by the secondary NAAQS include, but are not limited to, effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and wellbeing. This discussion presents key aspects of the current evidence of Pb-related welfare effects that are assessed in the ISA and the 2006 CD, drawing from the summary of policy-relevant aspects in the PA (PA, section 5.1).

Lead has been demonstrated to have harmful effects on reproduction and development, growth, and survival in many species as described in the assessment of the evidence available in this review and consistent with the conclusions drawn in the last review (ISA, section 1.7; 2006 CD, sections 7.1.5 and 7.2.5). A number of studies on ecological effects of Pb are newly available in this review and are critically assessed in the ISA as part of the full body of evidence. The full body of currently available evidence reaffirms conclusions on the array of effects recognized for Pb in the last review (ISA, section 1.7). In so doing, in the context of pollutant exposures considered relevant the ISA determines [71] that causal [72] or likely causal [73] relationships exist in both freshwater and terrestrial ecosystems for Pb with effects on reproduction and development in vertebrates and invertebrates; growth in plants and invertebrates; and survival in vertebrates and invertebrates (ISA, Table 1–3). In drawing judgments regarding causality for the criteria air pollutants, the ISA places emphasis on "evidence of effects at doses (*e.g.*, blood Pb concentration) or exposures (*e.g.*, air concentrations) that are relevant to, or somewhat above, those currently experienced by the population." The ISA notes that the "extent to which studies of higher concentrations are considered varies . . . but generally includes those with doses or exposures in the range of one to two orders of magnitude above current or ambient conditions." Studies "that use higher doses or exposures may also be considered . . . [t]hus, a causality determination is based on weight of evidence evaluation for health, ecological or welfare effects, focusing on the evidence from exposures or doses generally ranging from current levels to one or two orders of magnitude above current levels" (ISA, pp. lx to lxi).

Although considerable uncertainties are recognized in generalizing effects observed under particular, small-scale conditions, up to the ecosystem level of biological organization, the ISA determines that the cumulative evidence reported for Pb effects at such higher levels of biological organization and for endpoints in single species with direct relevance to population and ecosystem level effects (*i.e.*, development and reproduction, growth, survival) is sufficient to conclude that a causal relationship is likely to exist between Pb exposures and community and ecosystem-level effects in freshwater and terrestrial systems (ISA, section 1.7.3.7).

The ISA also presents evidence for saltwater ecosystems, concluding that current evidence is inadequate to make causality determinations for most population-level responses, as well as community and ecosystem effects, while finding the evidence to be suggestive linking Pb and effects on reproduction and development in marine invertebrates (ISA, Table 1–3, sections 6.3.12 and 6.4.21).

As in prior reviews of the Pb NAAQS, this review is focused on those effects most pertinent to ambient air Pb exposures. Given the reductions in ambient air Pb concentrations over the past decades, these effects are generally those associated with the lowest levels of Pb exposure that have been evaluated. Additionally, we recognize the limitations on our ability to draw conclusions about environmental exposures from ecological studies of organism-level effects, as most studies were conducted in laboratory settings which may not accurately represent field conditions or the multiple variables that govern exposure.

The relationship between ambient air Pb and ecosystem response is important in making the connection between current emissions of Pb and the potential for adverse ecological effects. The limitations in the data available on this subject for the last review were significant. There is no new evidence since the last review that substantially improves our understanding of the relationship between ambient air Pb and measurable ecological effects. As stated in the last review, the role of ambient air Pb in contributing to ecosystem Pb has been declining over the past several decades. It remains difficult to apportion exposure between air and other sources to inform our understanding of the potential for ecosystem effects that might be associated with air emissions. As noted in the ISA, "*[t]he amount of Pb in ecosystems is a result of a number of inputs and it is not currently possible to determine the contribution of atmospherically-derived Pb from total Pb in terrestrial, freshwater or saltwater systems*" (ISA, section 6.5). Further, considerable uncertainties also remain in drawing conclusions from effects evidence observed under laboratory conditions with regard to effects expected at the ecosystem level in the environment. In many cases it is difficult to characterize the nature and magnitude of effects and to quantify relationships between ambient concentrations of Pb and ecosystem response due to the existence of multiple stressors, variability in field conditions, and differences in Pb bioavailability at that level of organization (ISA, section 6.5). In summary, the ISA concludes that "[r]ecent information available since the 2006 Pb AQCD, includes additional field studies in both terrestrial and aquatic ecosystems, but the connection between air concentration and ecosystem exposure continues to be poorly characterized for Pb and the contribution of atmospheric Pb to specific sites is not clear" (ISA, section 6.5).

It is also important to consider the fate and transport of both current Pb and Pb emitted in the past. It is this past legacy of Pb that was cited as a significant source of uncertainty in the last review. The extensive history of Pb uses in developed countries coupled with atmospheric transport processes has left a legacy of Pb in ecosystems globally (*e.g.*, 2006 CD, sections 2.3.1 and 7.1; 1977 CD, section 6.3.1). Records of U.S. atmospheric emissions of Pb in the twentieth and late nineteenth centuries have been documented in sediment cores (PA, section 2.3; ISA, section 2.6.2; Landers et al., 2010). Once deposited, Pb can be transported by stormwater runoff or resuspension to catchments and nearby water bodies or stored in soil layers in forested areas, its further movement influenced by soil or sediment composition and chemistry and physical processes. Some new studies are available that provide additional information, briefly summarized below, on Pb cycling, flux and retention within terrestrial and aquatic systems. This new information does not fundamentally change our understanding from the last review of Pb movement through or accumulation in ecosystems over time but rather improves our understanding of some of the underlying processes and mechanisms in soil, water and sediment. There is little new information, however, on fate and transport in ecosystems specifically related to air-derived Pb (ISA, section 2.3). There is limited newly available information with regard to the timing of ecosystem recovery from historic atmospheric deposition of Pb (ISA, sections 2.3.2.4 and 2.3.3.3).

[71] Since the last Pb NAAQS review, the ISAs, which have replaced CDs in documenting each review of the scientific evidence (or air quality criteria), employ a systematic framework for weighing the evidence and describing associated conclusions with regard to causality, using established descriptors: "causal" relationship with relevant exposure, "likely" to be a causal relationship, evidence is "suggestive" of a causal relationship, "inadequate" evidence to infer a causal relationship, and "not likely" to be a causal relationship (ISA, Preamble).

[72] In determining that a causal relationship exists for Pb with specific ecological or welfare effects, the EPA has concluded that "[e]vidence is sufficient to conclude that there is a causal relationship with relevant pollutant exposures (*i.e.*, doses or exposures generally within one to two orders of magnitude of current levels)" (ISA, p. lxii).

[73] In determining a likely causal relationship exists for Pb with specific ecological or welfare effects, the EPA has concluded that "[e]vidence is sufficient to conclude that there is a likely causal association with relevant pollutant exposures . . . but uncertainties remain" (ISA, p. lxii).

Overall, recent studies in terrestrial ecosystems provide deposition data consistent with deposition fluxes reported in the 2006 CD and demonstrate consistently that atmospheric deposition of Pb has decreased since the phase-out of leaded on-road gasoline (PA, section 2.3.2.2; ISA, section 2.3.3). Follow-up studies in several locations at high elevation sites indicate little change in soil Pb concentrations since the phase-out of leaded onroad gasoline in surface soils, consistent with the high retention reportedly associated with reduced microbial activity at lower temperatures associated with high elevation sites. However, amounts of Pb in the surface soils at some lower altitude sites were reduced over the same time period in the same study (ISA, section 2.3.3). New studies in the ISA also enhance our understanding of Pb sequestration in forest soils by providing additional information on the role of leaf litter as a Pb reservoir in some situations and the effect of litter decomposition on Pb distribution (ISA, section 2.3.3).

Recent research on Pb transport in aquatic systems has provided a large body of observations confirming that such transport is dominated by colloids rich in iron and organic material (ISA, section 2.3.2). Recent research on Pb flux in sediments provides greater detail on resuspension processes than was available in the 2006 CD, including research on resuspended Pb largely associated with organic material or iron and manganese particles and research on the important role played by anoxic or depleted oxygen environments in Pb cycling in aquatic systems. This newer research is consistent with prior evidence in indicating that appreciable resuspension and release from sediments largely occurs during discrete events related to storms. It has also confirmed that resuspension is an important process that strongly influences the lifetime of Pb in bodies of water. Finally, there have been advances in understanding and modeling of Pb partitioning between organic material and sediment in aquatic environments (ISA, section 2.7.2).

The bioavailability of Pb is also an important component of understanding the effects Pb is likely to have on organisms and ecosystems (ISA, section 6.3.3). It is the amount of Pb that can interact within the organism that leads to toxicity, and there are many factors which govern this interaction (ISA, sections 6.2.1 and 6.3.3). The bioavailability of metals varies widely depending on the physical, chemical, and biological conditions under which an organism is exposed (ISA, section 6.3.3). Studies newly available since the last Pb NAAQS review provide additional insight into factors that influence the bioavailability of Pb to specific organisms (ISA, section 6.3.3). In general, this evidence is supportive of previous conclusions and does not identify significant new variables from those identified previously. Section 6.3.3 of the ISA provides a detailed discussion of bioavailability in terrestrial systems. With regard to aquatic systems, a detailed discussion of bioavailability in freshwater systems is provided in sections 6.4.3 and 6.4.4 of the ISA, and section 6.4.14 of the ISA discusses bioavailability in saltwater systems.

In terrestrial systems, the amount of bioavailable Pb present determines the impact of soil Pb to a much greater extent than does the total amount present (ISA, section 6.3.11). In such ecosystems, Pb is deposited either directly onto plant surfaces or onto soil where it can bind with organic matter or dissolve in pore water. The Pb dissolved in pore water is particularly bioavailable to organisms in the soil and, therefore, the impact of this Pb on the ecosystem is potentially greater than soil Pb that is not in pore water (ISA, section 6.3.11).

In aquatic systems as in terrestrial systems, the amount of Pb bioavailable to organisms is a better predictor of effect on organisms than the overall amount of Pb in the system. Once atmospherically derived Pb enters surface water bodies through deposition or runoff, its fate and bioavailability are influenced by many water quality characteristics, such as pH, suspended solids levels and organic content (ISA, section 6.4.2). In sediments, bioavailability of Pb to sediment-dwelling organisms may be influenced by the presence of other metals, sulfides, iron oxides and manganese oxides and also by physical disturbance (ISA, section 2.6.2). For many aquatic organisms, Pb dissolved in the water column can be the primary exposure route, while for others sediment ingestion is significant (ISA, section 2.6.2). As recognized in the 2006 CD and further supported in the ISA, there is a body of evidence showing that uptake and elimination of Pb vary widely among aquatic species.

There is a substantial amount of new evidence in this review regarding the ecological effects of Pb on individual terrestrial and aquatic species with less new information available on marine species and ecosystems. On the whole, this evidence supports previous conclusions that Pb has effects on growth, reproduction and survival, and that under some conditions these effects can be adverse to organisms and ecosystems. The ISA provides evidence of effects in additional species and in a few cases at lower exposures than reported in the previous review, but does not substantially alter our understanding of the ecological endpoints affected by Pb from the previous review. Looking beyond organism-level evidence, the evidence of adversity in natural systems remains sparse due to the difficulty in determining the effects of confounding factors such as co-occurring metals or system characteristics that influence bioavailability of Pb in field studies. The following paragraphs summarize the information presented in this review for terrestrial, aquatic and marine systems.

With regard to terrestrial ecosystems, recent studies cited in this review support previous conclusions about the effects of Pb, namely that increasing soil Pb concentrations in areas of Pb contamination (*e.g.*, mining sites and industrial sites) can cause decreases in microorganism abundance, diversity, and function. Previous reviews have also reported on effects on bird and plant communities (2006 CD, section AX7.1.3). The shifts in bacterial species and fungal diversity have been observed near long-established sources of Pb contamination (ISA, section 6.3.12.7). Most recent evidence for Pb toxicity to terrestrial plants, invertebrates and vertebrates is from single-species assays in laboratory studies which do not capture the complexity of bioavailability and other modifiers of effect in natural systems (ISA, section 6.3.12.7). Further, models that might account for modifiers of bioavailability have proven difficult to develop (ISA, p. 6–16).

Evidence presented in the ISA and prior CDs demonstrates the toxicity of Pb in aquatic ecosystems and the role of many factors, including Pb speciation and various water chemistry properties, in modifying toxicity (ISA, section 1.7.2). Since the 2006 CD, additional evidence for community and ecosystem level effects of Pb is available, primarily in microcosm studies or field studies with other metals present (ISA, section 6.4.11). Such evidence described in previous CDs includes alteration of predator-prey dynamics, species richness, species composition, and biodiversity. New studies available in this review provide evidence in additional habitats for these community and ecological-scale effects, specifically in aquatic plant communities and sediment-associated communities at both acute and chronic exposures involving concentrations similar to those previously reported (ISA, section 6.4.7). In many cases, it is difficult to characterize the nature and magnitude of effects and to quantify relationships between ambient concentrations of Pb and ecosystem response due to existence of multiple ecosystem-level stressors, variability in field conditions, and differences in Pb bioavailability (ISA, sections 1.7.3.7 and 6.4.7). Additionally, the degree to which air concentrations have contributed to such effects in freshwater ecosystems is largely unknown.

With regard to evidence in marine ecosystems, recently available evidence on the toxicity of Pb to marine algae augments the 2006 CD findings of variation in sensitivity across marine species. Recent studies on Pb exposure include reports of growth inbibition and oxidative stress in a few additional species of marine algae (ISA, section 6.4.15). Recent literature provides little new evidence of endpoints or effects in marine invertebrates beyond those reported in the 2006 CD. For example, some recent studies strengthen the evidence presented in the 2006 CD regarding negative effects of Pb exposure on marine invertebrates (ISA, section 6.4.15.2). Recent studies also identify several species exhibiting particularly low sensitivity to high acute exposures (ISA, section 6.4.15.2). Little new evidence is available of Pb effects on marine fish and mammals for reproductive, growth and survival endpoints that are particularly relevant to the population level of biological organization and bigber (ISA, section 6.4.15). New studies on organism-level effects from Pb in saltwater ecosystems (ISA, section 6.4.15) provide little evidence to inform our underatanding of linkages among atmospheric concentrations, ambient exposures in saltwater systems and such effects or to inform our conclusions regarding tbe likelihood of adverse effects under conditions associated with the current NAAQS for Pb. Nor does the currently available evidence indicate significantly different exposure levels from the previous review at which ecological systems or receptors are expected to experience effects.

During the last review, the 2006 CD assessed the available information on critical loads for Pb (2006 CD, section 7.3). This information included publications on methods and example applications, primarily in Europe, specific to the bedrock geology, soil types, vegetation, and bistorical deposition trends in each European country (2006 CD, p. E–24), with no analyses available for U.S. locations (2006 CD, sections 7.3.4–7.3.6). As a result, the 2006 CD concluded that "[c]onsiderable research is necessary before critical load estimates can be formulated for ecosystems extant in the United States" (2006 CD, p. E–24).

For this current review, newly available evidence pertaining to critical loads analysis includes limited recent researcb on consideration of bioavailability in characterizing Pb effect concentrations or indices and on modeling approacbes to incorporate cbemistry effects on Pb speciation and bioavailability (ISA, sections 6.3.7 and 6.4.8). With consideration of this information and the four critical load analysis studies newly available in this review (none of which are for U.S. ecosystems), the ISA does not modify the conclusions noted above from the 2006 CD (ISA, sections 6.1.3, 6.3.7 and 6.4.8). In summary, the new information in this review does not appreciably change our evidence base or further inform our understanding of critical loads of Pb, including critical loads in sensitive U.S. ecosystems.

There is no new evidence since the last review that substantially improves our understanding of tbe relationship between ambient air Pb and measurable ecological effects. As stated in the last review, the role of ambient air Pb in contributing to ecosystem Pb has been declining over the past several decades. It remains difficult to apportion exposure between air and other sources to better inform our understanding of the potential for ecosystem effects that migbt be associated with air emissions. As noted in the ISA, "[t]he amount of Pb in ecosystems is a result of a number of inputs and it is not currently possible to determine the contribution of atmospherically-derived Pb from total Pb in terrestrial, freshwater or saltwater systems" (ISA, section 6.5). Further, considerable uncertainties also remain in drawing conclusions from evidence of effects observed under laboratory conditions with regard to effects expected at the ecosystem level in the environment. In many cases it is difficult to cbaracterize the nature and magnitude of effects and to quantify relationships between ambient concentrations of Pb and ecosystem response due to the existence of multiple stressors, variability in field conditions, and differences in Pb bioavailability at that level of organization (ISA, section 6.5). In summary, the ISA concludes that "[r]ecent information available since the 2006 Pb AQCD, includes additional field studies in botb terrestrial and aquatic ecosystems, but the connection between air concentration and ecosystem exposure continues to be poorly characterized for Pb and the contribution of atmospheric Pb to specific sites is not clear" (ISA, section 6.5).

C. Summary of Risk Assessment Information

The risk assessment information available in this review and summarized here is based on the screaning-level risk assessment performed for the last review, described in the 2006 REA, 2007 Staff Paper and 2008 notice of final decision (73 FR 66964, November 12, 2008), as considered in the context of the evidence newly available in this review (PA, section 5.2). As described in the REA Planning Document, careful consideration of the information newly available in this review, with regard to designing and implementing a full REA for this review, led us to conclude that performance of a new REA for this review was not warranted (REA Planning Document, section 3.3). Based on their consideration of the REA Planning Document analysis, the CASAC Pb Review Panel generally concurred with the conclusion that a new REA was not warranted in this review (Frey, 2011b). Accordingly, the risk/exposure information considered in this review is drawn primarily from the 2006 REA as summarized below (PA, section 5.2 and Appendix 5A; REA Planning Document, section 3.1).

The 2006 screening-level assessment focused on estimating the potential for ecological risks associated with ecosystem exposures to Pb emitted into ambient air (PA, section 5.2; 2006 REA, section 7). A national-scale screen was used to evaluate surface water and sediment monitoring locations across the U.S. for the potential for ecological impacts that might be associated with atmospheric deposition of Pb (2006 REA, section 7.1.2). In addition to the national-scale screen (2006 REA, section 3.6), the assessment involved a case study approacb, with case studies for areas surrounding a primary Pb smelter (2006 REA, section 3.1) and a secondary Pb smelter (2006 REA, section 3.2), as well as a location near a non-urban roadway (2006 REA, section 3.4). An additional case study, focused on

consideration of atmospherically derived Pb effects on an ecologically vulnerable ecosystem (Hubbard Brook Experimental Forest), was identified (2006 REA, section 3.5). The Hubbard Brook Experimental Forest (HBEF), in the White Mountain National Forest, near North Woodstock, New Hampshire, was selected as a fourth case study because of its location and its long record of available data on concentration trends of Pb in three media (air or deposition from air, soil, and surface water). The HBEF case study was a qualitative analysis focusing on a summary review of the literature, without new quantitative analyses (2006 REA, Appendix E). For the other three case studies, exposure concentrations of Pb in soil, surface water, and/or sediment concentrations were estimated from available monitoring data or modeling analysis and then compared to ecological screening benchmarks (2006 REA, section 7.1).

In interpreting the results from the 2006 REA, the PA considers newly available evidence that may inform interpretation of risk under the now current standard (PA, section 5.2). Factors that could alter our interpretation of risk would include new evidence of barm at lower concentrations of Pb, new linkages that enable us to draw more explicit conclusions as to tbe air contribution of environmental exposures, and new methods of interpreting confounding factors that were largely uncontrolled in the previous risk assessment. In general, however, the key uncertainties identified in the last review remain today.

The results for the ecological screening assessment for the three case studies and the national-scale screen for surface water and for sediment in the last review indicated a potential for adverse effects from ambient Pb to multiple ecological receptor groups in terrestrial and aquatic locations. Detailed descriptions of the location-specific case studies and the national screening assessment, key findings of the risk assessment for each, and an interpretation of the results with regard to past air conditions can be found in the 2006 REA. In considering the potential for adverse welfare effects to result from levels of air-related Pb that would meet the current standard, the findings of the 2006 REA, as summarized in the PA, are discussed below.

While the contribution to Pb concentrations from air as compared to nonair sources is not quantified, air emissions from the primary Pb smelter case study facility were substantial (2006 REA, Appendix B). In addition, this facility, which closed in 2013, had been emitting Pb for many decades, including some seven decades prior to establishment of any Pb NAAQS, such that it is likely air concentrations associated with the facility were substantial relative to the 1978 NAAQS, which it exceeded at the time of the last review. At the time of the last review and also since the adoption of the current standard, concentrations monitored near this facility have exceeded the level of the applicable NAAQS (2007 Staff Paper, Appendix 2B–1; PA, Appendices 2D and 5A). Accordingly, this case study is not informative for considering the likelihood of adverse welfare effects related to Pb from air sources under air quality conditions associated with meeting the current Pb standard.

The secondary Pb smelter case study location continues to emit Pb, and the county where this facility is located does not meet the current Pb standard (PA, Appendices 2D and 5A). Given the exceedances of the current standard, which likely extend back over 4 to 5 decades, this case study also is not informative for considering the likelibood of adverse welfare effects related to Pb from air sources under air quality conditions associated with meeting the current Pb standard.

The locations for the near-roadway non-urban case study are highly impacted by past deposition of gasoline Pb. It is unknown wbether current conditions at these sites exceed the current Pb standard, but, given evidence from the past of Pb concentrations near highways that ranged above the previous (1978) Pb standard (1986 CD, section 7.2.1), conditions at these locations during the time of leaded gasoline very likely exceeded the current standard. Similarly, those conditions likely resulted in Pb deposition associated with leaded gasoline that exceeds that being deposited under air quality conditions that would meet the current Pb standard. Given this legacy, consideration of the potential for environmental risks from levels of air-related Pb associated witb meeting the current Pb standard in these locations is highly uncertain.

Tbe extent to wbich past air emissions of Pb have contributed to surface water or sediment Pb concentrations at the locations identified in the national scale surface water and sediment screen is unclear. For some of the surfaca water locations, nonair sources likely contributed significantly to the surface water Pb concentrations. For other locations, a lack of nearby nonair sources indicated a potential role for air sources to contribute to observed surface water Pb concentrations. Additionally, these concentrations may have been influenced by Pb in resuspended sediments and may reflect contribution of Pb from erosion of soils with Pb derived from historic as well as current air emissions.

The most useful case study to the current review is that of the Vulnerable Ecosystem Case Study located in the HBEF. This case study was focused on consideration of information wbich included a long record (from 1976 through 2000) of available data on concentration trends of Pb in three media (air or deposition from air, soil, and surface water). While no quantitative analyses were performed, a summary review of literature published on HBEF was developed. Tbis review indicated: (1) Atmospheric Pb inputs do not directly affect stream Pb levels at HBEF because deposited Pb is almost entirely retained in tbe soil profile; and (2) soil horizon analysis results showed Pb to have become more concentrated at lower soil depths over time, with the soil serving as a Pb sink, appreciably reducing Pb in pore water as it moves through the soil layers to streams (dissolved Pb concentrations were reduced from 5 μg/L to about 5 ng/L from surface soil to streams). As a result, the HBEF studies concluded that the contribution of dissolved Pb from soils to streams was insignificant (2006 REA, Appendix E). Further, atmospheric input of Pb, based on bulk precipitation data, was estimated to decline substantially from the mid-1970s to 1989; forest floor soil Pb concentrations between 1976 and 2000 were also estimated to decline appreciably (2006 REA, sections E.1 and E.2). In considering HBEF and other terrestrial sites with Pb burdens derived primarily from long-range atmospheric transport, the 2006 CD found tbat "[d]espite years of elevated atmospheric Pb inputs and elevated concentrations in soils, there is little evidence that sites affected primarily by long-range Pb transport have experienced significant effects on ecosystem structure or function" (2006 CD, p. AX7–98). The explanation suggested by the 2006 CD for this finding is "[l]ow concentrations of Pb in soil solutions, the result of strong complexation of Pb by soil organic matter" (2006 CD, p. AZX7–98). While more recent soil or stream data on Pb concentrations are not available, we find it unlikely, given the general evidence for air Pb emissions and concentration declines over the past several decades (e.g., PA, Figures 2–1, 2–7 and 2–8), that conditions would have worsened from those on which these conclusions were drawn (e.g., soil data through 2000). Therefore, this information suggests that the now-lower ambient air concentrations associated with meeting the current standard would not be expected to directly impact stream Pb levels.

With regard to new evidence of Pb effects at lower concentrations, it is necessary to consider that the evidence of adversity due specifically to Pb in natural systems is limited, in no small part because of the difficulty in determining the effects of confounding factors such as multiple metals and modifying factors influencing bioavailability in field studies. Modeling of Pb-related exposure and risk to ecological receptors is subject to a wide array of sources of both variability and uncertainty. Variability is associated with geographic location, habitat types, physical and chemical characteristics of soils and water that influence Pb bioavailability and terrestrial and aquatic community composition. Lead uptake rates by invertebrates, fish, and plants may vary by species and season. For wildlife, variability also is associated with food ingestion rates by species and season, prey selection, and locations of home ranges for foraging relative to the Pb contamination levels (USEPA, 2005b).

There are significant difficulties in quantifying the role of air emissions under the current standard, which is significantly lower than the previous standard. As recognized in the PA, Pb deposited before the standard was enacted remains in soils and sediments, complicating interpretations regarding the impact of the current standard; bistoric Pb emitted from leaded gasoline usage continues to move slowly through systems along with more recently deposited Pb and Pb derived from nonair sources (PA, section 1.3.2). The results from the location-specific case studies and the surface and sediment screen performed in the last review are difficult to interpret in light of the current standard and are largely not useful in informing judgments of the potential for adverse effects at levels of deposition meeting the current standard.

D. Conclusions on Adequacy of the Current Secondary Standard

1. Evidence- and Risk-Based Considerations in the Policy Assessment

The current evidence, as discussed more fully in the PA, continues to support the conclusions from the previous review regarding key aspects of the ecological effects evidence for Pb and the effects of exposure associated with levels of Pb occurring in ecological media in the U.S. The EPA's conclusions in this regard are based on consideration of the assessment of the currently available evidence in the ISA, particularly with regard to key aspects summarized in the PA.

In considering the welfare effects evidence with respect to the adequacy of the current standard, the PA considers the array of evidence newly assessed in the ISA with regard to the degree to which this evidence supports conclusions about the effects of Pb in the environment that were drawn in the last review and the extent to which it reduces previously recognized areas of uncertainty. Further, the PA considers the current evidence and associated conclusions about the potential for effects to occur as a result of the much lower ambient Pb concentrations allowed by the current secondary standard (set in 2008) than those allowed by the prior standard, which was the focus of the last review. These considerations, as discussed below, inform the Administrator's conclusions regarding the extent to which the evidence supports or calls into question the adequacy of protection afforded by the current standard.

The range of effects that Pb can exert on terrestrial and aquatic organisms indicated by information available in the current review is summarized in the ISA (ISA, sections 1.7, 6.3 and 6.4) and largely mirrors the findings of the previous review (PA, section 5.1). The integrated synthesis contained in the ISA conveys how effects of Pb can vary with species and life stage, duration of exposure, form of Pb, and media characteristics such as soil and water chemistry. A wide range of organism effects are recognized, including effects on growth, development (particularly of the nervous system) and reproductive success (ISA, sections 6.3 and 6.4). Lead is recognized to distribute from the air into multiple environmental media, as summarized in section I.D above, contributing to multiple exposure pathways for ecological receptors. As discussed in section 5.1 of the PA, many factors affect the bioavailability of Pb to receptors in terrestrial and aquatic ecosystems, contributing to differences between laboratory-assessed toxicity and Pb toxicity in these ecosystems, and challenging our consideration of environmental impacts of Pb emitted to ambient air.

In studies in a variety of ecosystems, adverse ecosystem-level effects (including decreases in species diversity, loss of vegetation, changes to community composition, primarily in soil microbes and plants, decreased growth of vegetation, and increased number of invasive species) have been demonstrated near smelters, mines and other industries that have released substantial amounts of Pb, among other materials, to the environment (ISA, sections 6.3.12 and 6.4.12). As noted in the PA, however, our ability to characterize the role of air emissions of Pb in contributing to these effects is complicated because of coincident releases to other media and of other pollutants. Co-released pollutants include a variety of other heavy metals, in addition to sulfur dioxide, which may cause toxic effects in themselves and may interact with Pb in the environment, contributing uncertainty to characterization of the role of Pb from ambient air with regard to the reported effects (PA, section 5.1). These uncertainties limit our ability to draw conclusions regarding the extent to which Pb-related effects may be associated with ambient air conditions that would meet the current standard.

The role of historically emitted Pb poses additional complications in addressing this question, as discussed in the PA (PA, section 1.3.2). The vast majority of Pb in the U.S. environment today, particularly in terrestrial ecosystems, was deposited in the past during the use of Pb additives in gasoline (2006 CD, pp. 2–82, AX7–36 to AX7–38, AX7–98; Johnson et al., 2004), although contributions from industrial activities, including metals industries, have also been documented (ISA, section 2.2.2.3, Jackson et al., 2004). The gasoline-derived Pb was emitted in very large quantities (2006 CD, p. AX7–98 and ISA, Figure 2–8) and predominantly in small sized particles which were widely dispersed and transported across large distances, within and beyond the U.S. (ISA, section 2.2). As recognized in the PA, historical records provided by sediment cores in various environments document the substantially reduced Pb deposition (associated with reduced Pb emissions) in many locations (PA, sections 2.3.1 and 2.3.3.2; ISA, section 2.2.1). As Pb is persistent in the environment, these substantial past environmental releases are expected to generally dominate current nonair media concentrations.

There is very limited evidence to relate specific ecosystem effects with current ambient air concentrations of Pb through deposition to terrestrial and aquatic ecosystems and subsequent movement of deposited Pb through the environment (e.g., soil, sediment, water, organisms). The potential for ecosystem effects of Pb from atmospheric sources under conditions meeting the current standard is difficult to assess due to limitations on the availability of information to fully characterize the distribution of Pb from the atmosphere into ecosystems over the long term, as well as limitations on information on the bioavailability of atmospherically deposited Pb (as affected by the specific characteristics of the receiving ecosystem). Therefore, while information available since the 2006 CD includes additional terrestrial and aquatic field studies, "the connection between air concentration and ecosystem exposure and associated potential for welfare effects continues to be poorly characterized for Pb" (ISA, section 6.5). Such a connection is even harder to characterize with respect to the current standard than it was in the last review with respect to the previous, much higher, standard.

The current evidence also continues to support conclusions from the last review with regard to interpreting the risk and exposure results. These conclusions are based on consideration of the screening-level ecological risk assessment results from the last review as described in the 2006 REA and summarized in the notice of final rulemaking (73 FR 67009, November 12, 2008) and in light of the currently available evidence in the ISA (PA, section 5.2). As noted in section III.C above, the results from three of the four case studies and from the national screens are largely not useful in informing judgments of the potential for adverse effects at levels of deposition associated with conditions that meet the current standard. The Vulnerable Ecosystem Case Study at the HBEF is more illustrative with regard to the current review and, accordingly, is given primary consideration. The EPA concluded that atmospheric Pb inputs of the past did not directly affect stream Pb levels at HBEF because deposited Pb is almost entirely retained in the soil profile and that there was "little evidence that sites affected primarily by long-range Pb transport [such as this one] have experienced significant effects on ecosystem structure or function" (2006 CD, p. AX–98). We further note here that, as conditions are unlikely to have worsened since those on which those conclusions were based, we find it likely that current ambient air concentrations do not directly impact stream Pb levels under air quality conditions associated with meeting the now-current standard.

The available risk and exposure information continues to be sufficient to conclude that the 1978 standard was not providing adequate protection to ecosystems and, when considered with regard to air-related ecosystem exposures likely to occur with air Pb levels that just meet the now-current standard, additionally does not provide evidence of adverse effects under the current standard.

2. CASAC Advice

In the current review of the secondary standard for Pb, the CASAC has provided advice and recommendations in their review of drafts of the ISA, of the REA Planning Document, and of the draft PA. We have additionally received comments from the public on drafts of these documents.[74]

In their advice and comments conveyed in the context of their review of the draft PA, the CASAC agreed with staff's preliminary conclusions that the available information since the last review is not sufficient to warrant revision to the secondary standard (Frey, 2013b). On this subject, the CASAC letter said that "[o]verall, the CASAC concurs with the EPA that the current scientific literature does not support a revision to the Primary Lead (Pb) National Ambient Air quality Standard (NAAQS) nor the Secondary Pb NAAQS" (Frey, 2013b, p. 1). The CASAC also recognized the many uncertainties and data gaps in the new scientific literature and recommended that research be performed in the future to address these limitations (Frey, 2013b, p. 2).

> Given the existing scientific data, the CASAC concurs with retaining the current secondary standard without revision. However, the CASAC also notes that important research gaps remain. For example questions remain regarding the relevance of the primary standard's indicator, level, averaging time, and form for the secondary standard. Other areas for additional research to address data gaps and uncertainty include developing a critical loads approach for U.S. conditions and a multi-media approach to account for legacy Pb and contributions from different sources. Addressing these gaps may require reconsideration of the secondary standard in future assessments.

The very few public comments received on this review to date that have addressed adequacy of the current secondary Pb standard indicate support for retaining the current standard without revision, generally grouping the secondary standard with their similar view on the primary standard.

3. Administrator's Proposed Conclusions on the Adequacy of the Current Standard

Based on the evidence and risk assessment information that is available in this review concerning the ecological effects and potential public welfare impacts of Pb emitted into ambient air, the Administrator proposes to conclude that the current secondary standard provides the requisite protection of public welfare from adverse effects and should be retained.

In considering the adequacy of the current standard, the Administrator has considered the assessment of the available evidence and conclusions contained in the ISA; the staff assessment of and conclusions regarding the policy-relevant technical information, including screening-level risk information, presented in the PA; the advice and recommendations from CASAC; and public comments to date in this review. In the discussion below, the Administrator gives weight to the PA conclusions, with which CASAC has concurred, and takes note of key aspects of the rationale presented for those conclusions which contribute to her proposed decision.

The Administrator notes the conclusion in the PA that the body of evidence on the ecological effects of Pb, expanded in some aspects since the last review, continues to support identification of ecological effects in organisms relating to growth, reproduction, and survival as the most relevant endpoints associated with Pb exposure. In consideration of the appreciable influence of site-specific environmental characteristics on the bioavailability and toxicity of environmental Pb in our assessment here, the PA noted the lack of studies conducted under conditions closely reflecting the natural environment. The currently available evidence, while somewhat expanded since the last review, does not include evidence of significant effects at lower concentrations or evidence of higher level ecosystem effects beyond those reported in the last review. There continue to be significant difficulties in interpreting effects evidence from laboratory studies to the natural environment and linking those effects to ambient air Pb concentrations. Further, the PA notes that the EPA is aware of no new critical loads information that would inform our interpretation of the public welfare significance of the effects of Pb in various U.S. ecosystems (PA, section 5.1). In summary, while new research has added to the understanding of Pb biogeochemistry and expanded the

[74] All written comments submitted to the agency will be available in the docket for this rulemaking, as will be transcripts and minutes of the public meetings held in conjunction with CASAC's review of drafts of the PA, the REA Planning Document and the ISA.

list of organisms for which Pb effects have been described, the PA notes there remains a significant lack of knowledge about the potential for adverse effects on public welfare from ambient air Pb in the environment and the exposures that occur from such air-derived Pb, particularly under conditions meeting the current standard (PA, section 6.2.1). Thus, the scientific evidence presented in detail in the ISA, inclusive of that newly available in this review, is not substantively changed, most particularly with regard to the adequacy of the now current standard, from the information that was available in and supported the decision for revision in the last review (PA, section 6.2.1).

With respect to exposure/risk-based considerations, the PA recognizes tbe complexity of interpreting the previous risk assessment with regard to the ecological risk of ambient air Pb associated with conditions meeting the current standard and the associated limitations and uncertainties of such assessments. For example, the location-specific case studies as well as the national screen conducted in the last review reflect both current air Pb deposition as well as past air and nonair source contributions (PA, section 6.3). The Administrator takes note of the PA conclusion that the previous assessment is consistent with and generally supportive of the evidence-based conclusions about Pb in the environment, yet the limitations on our ability to apportion Pb between past and present air contributions and between air and nonair sources remain significant.

In the Administrator's consideration of the information available in this review of the Pb secondary standard, she gives weight to the PA conclusion that the currently available evidence and exposure/risk information do not call into question the adequacy of the current standard to provide the requisite protection for public welfare (PA, section 6.3). In so doing, she also notes the advice from CASAC in this review, including that "[g]iven the existing scientific data, the CASAC concurs with retaining the current secondary standard without revision." In light of these and the above considerations, the Administrator finds that the currently available information does not call into question the adequacy of the current standard to provide the requisite protection for public welfare and, accordingly, reaches the conclusion that it is appropriate to retain the current secondary standard without revision. The Administrator solicits comment on this conclusion.

IV. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *http://www2.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a significant regulatory action and was, therefore, not submitted to the Office of Management and Budget for review.

B. Paperwork Reduction Act

This action does not impose an information collection burden under the Paperwork Reduction Act. There are no information collection requirements directly associated with revisions to a NAAQS under section 109 of the CAA and this action does not propose any revisions to the NAAQS.

C. Regulatory Flexibility Act

I certify that this action will not have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act. This action will not impose any requirements on small entities. Rather, this action proposes to retain, without revision, existing national standards for allowable concentrations of lead in ambient air as required by section 109 of the CAA. *See also* American Trucking Associations v. EPA. 175 F.3d at 1044–45 (NAAQS do not have significant impacts upon small entities because NAAQS tbemselves impose no regulations upon small entities).

D. Unfunded Mandates Reform Act

This action does not contain any unfunded mandate as described in the Unfunded Mandates Reform Act, 2 U.S.C. 1531–1538 and does not significantly or uniquely affect small governments. This action imposes no enforceable duty on any state, local or tribal governments or the private sector.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175. This action does not change existing regulations. It does not have a substantial direct effect on one or more Indian Tribes, since Tribes are not obligated to adopt or implement any NAAQS. The Tribal Authority Rule gives Tribes the opportunity to develop and implement CAA programs such as the Pb NAAQS, but it leaves to the discretion of the Tribe whether to develop these programs and which programs, or appropriate elements of a program, they will adopt. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866. Tbe health effects evidence and risk assessment information for this action, which focuses on children in addressing the at-risk population, is summarized in sections II.B, II.C and II.D, and described in the ISA and PA, copies of which are in the puhlic docket for this action.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution or Use

Tbis action is not subject to Executive Order 13211, because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

This rulemaking does not involve technical standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action will not have disproportionately high and adverse human health or environmental effects on minority, low-income or indigenous populations. The action proposed in this notice is to retain without revision the existing NAAQS for Pb based on the Administrator's conclusion that the existing standards protect public health, including the health of sensitive groups, with an adequate margin of safety. As discussed earlier in this preamble (see section II), the EPA expressly considered the available information regarding health effects among at-risk populations in reaching the proposed decision that the existing standards are requisite.

K. Determination Under Section 307(d)

Section 307(d)(1)(V) of the CAA provides that the provisions of section 307(d) apply to "such other actions as the Administrator may determine." Pursuant to section 307(d)(1)(V), the Administrator determines that this action is subject to the provisions of section 307(d).

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List of Subjects in 40 CFR Part 50

Environmental protection, Air pollution control, Carbon monoxide, Lead, Nitrogen dioxide, Ozone, Particulate matter, Sulfur oxides.

Dated: December 19, 2014.

Gina McCarthy,

Administrator.

[FR Doc. 2014–30681 Filed 1–2–15; 8:45 am]

BILLING CODE 6560–50–P

acknowledges that further refinements to the listed species assessment will be completed in future revisions and requests public comment on specific areas that will reduce the uncertainties associated with the characterization of risk to listed species identified in the current assessment. The human health risk assessment includes all uses of sulfur, including gas cartridges. The most recent ecological risk assessment includes all uses except gas cartridges. A separate ecological risk assessment for gas cartridge uses was conducted in 2010 and can be found in the sulfur registration review docket.

- *Triflumizole.* The registration review docket for triflumizole (EPA–HQ–OPP–2006–0115) opened in the **Federal Register** issue of March 28, 2007 (72 FR 14548) (FRL–8118–3). Triflumizole is a broad spectrum, imidazole fungicide (group 3) that inhibits ergosterol biosynthesis in fungi. It is registered for use on a variety of agricultural crops, ornamentals in greenhouses/shade houses, interior scapes, and Christmas trees/conifers on nurseries and plantations. It is also registered for use as a pre-plant pineapple seed treatment. The Agency has conducted a human health risk assessment for dietary (food and drinking water), residential and occupational exposure pathways. The Agency has also conducted a quantitative ecological risk assessment, which includes a screening-level listed species assessment. EPA acknowledges that further refinements to the listed species assessment will be completed in future revisions and requests public comment on specific areas that will reduce the uncertainties associated with the characterization of risk to listed species identified in the current assessment.

1. *Other related information.* Additional information on these pesticides is available on the chemical pages for these pesticides in Chemical Search, *http://www.epa.gov/pesticides/chemicalsearch*, and in each chemical's individual docket listed in Table 1. in Unit III. Information on the Agency's registration review program and its implementing regulation is available at *http://www.epa.gov/oppsrrd1/registration_review.*

2. *Information submission requirements.* Anyone may submit data or information in response to this document. To be considered during a pesticide's registration review, the submitted data or information must meet the following requirements:

- To ensure that EPA will consider data or information submitted, interested persons must submit the data or information during the comment period. The Agency may, at its discretion, consider data or information submitted at a later date.
- The data or information submitted must be presented in a legible and useable form. For example, an English translation must accompany any material that is not in English and a written transcript must accompany any information submitted as an audiographic or videographic record. Written material may be submitted in paper or electronic form.
- Submitters must clearly identify the source of any submitted data or information.
- Submitters may request the Agency to reconsider data or information that the Agency rejected in a previous review. However, submitters must explain why they believe the Agency should reconsider the data or information in the pesticide's registration review.

As provided in 40 CFR 155.58, the registration review docket for each pesticide case will remain publicly accessible through the duration of the registration review process; that is, until all actions required in the final decision on the registration review case have been completed.

List of Subjects

Environmental protection, Acetaminophen, Clofentezine, Fluazinam, Hexythiazox, Pesticides and pests, Quinclorac, Sulfur, Triflumizole.

Dated: June 19, 2013.

Michael Goodis,

Acting Director, Pesticide Re-Evaluation Division, Office of Pesticide Programs.

[FR Doc. 2013–15304 Filed 6–25–13; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[FRL–9827–4]

Integrated Science Assessment for Lead

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of availability.

SUMMARY: EPA is announcing the availability of a final document titled, "Integrated Science Assessment for Lead" (EPA/600/R–10/075F). The document was prepared by the National Center for Environmental Assessment (NCEA) within EPA's Office of Research and Development as part of the review of the national ambient air quality standards (NAAQS) for lead (Pb).

DATES: The document will be available on or around June 26, 2013.

ADDRESSES: The "Integrated Science Assessment for Lead" will be made available primarily through the Internet on the NCEA home page under the Recent Additions and Publications menus at *http://www.epa.gov/ncea*. A limited number of CD–ROM or paper copies will be available. Contact Ms. Marieka Boyd by phone: 919–541–0031; fax: 919–541–5078; or email: *boyd.marieka@epa.gov* to request either of these, and please provide your name, your mailing address, and the document title, "Integrated Science Assessment for Lead" (EPA/600/R–10/075F) to facilitate processing of your request.

FOR FURTHER INFORMATION CONTACT: For technical information, contact Dr. Ellen Kirrane, NCEA; telephone: 919–541–1340; facsimile: 919–541–2985; or email: *Kirrane.ellen@epa.gov.*

SUPPLEMENTARY INFORMATION:

Background

Section 108 (a) of the Clean Air Act directs the Administrator to identify certain pollutants, which among other things, "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare" and to issue air quality criteria for them. These air quality criteria are to "accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of [a] pollutant in the ambient air. . . ." Under section 109 of the Act, EPA is then to establish NAAQS for each pollutant for which EPA has issued criteria. Section 109 (d) of the Act subsequently requires periodic review and, if appropriate, revision of existing air quality criteria to reflect advances in scientific knowledge on the effects of the pollutant on public health or welfare. EPA is also to periodically review and, if appropriate, revise the NAAQS, based on the revised air quality criteria.

Pb is one of six "criteria" pollutants for which EPA has established NAAQS. Periodically, EPA reviews the scientific basis for these standards by preparing an Integrated Science Assessment (ISA) (formerly called an Air Quality Criteria Document). The ISA provides a concise review, synthesis, and evaluation of the most policy-relevant science to serve as a scientific foundation for the review of the NAAQS. The Clean Air Scientific Advisory Committee (CASAC), an independent science advisory committee whose review and advisory functions are mandated by Section 109

(d) (2) of the Clean Air Act, is charged (among other things) with independent scientific review of EPA's air quality criteria.

On February 26, 2010 (75 FR 8934), EPA formally initiated its current review of the air quality criteria for Pb, requesting the submission of recent scientific information on specified topics. Soon after, a science policy workshop was held to identify key policy issues and questions to frame the review of the Pb NAAQS (75 FR 20843). Drawing from the workshop discussions, a draft of EPA's "Integrated Review Plan for the National Ambient Air Quality Standards for Lead" (EPA/452/D–11/001) was developed and made available in March 2011 for public comment and was discussed by the CASAC Pb Review Panel (CASAC panel) via a publicly accessible teleconference consultation on May 5, 2011 (76 FR 20347, 76 FR 21346). The final Integrated Review Plan was released in December 2011 (76 FR 76972) and is available at *http://www.epa.gov/ttn/naaqs/standards/pb/s_pb_2010_pd.html.*

As part of the science assessment phase of the review, EPA held a workshop in December 2010 to discuss, with invited scientific experts, initial draft materials prepared in the development of the ISA (75 FR 69078). The first external review draft ISA for Pb was released on May 6, 2011 (*http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=226323*). The CASAC panel met at a public meeting on July 20, 2011, to review the draft ISA (76 FR 36120). Subsequently, on December 9, 2011, the CASAC provided a consensus letter for their review to the Administrator of the EPA (*http://yosemite.epa.gov/sab/sabproduct.nsf/fedrgstr_activites/D3E2E8488025344D852579610068A8A1/$File/EPA-CASAC-12-002-unsigned.pdf*). The second external review draft ISA for Pb was released on February 2, 2012 (*http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=235331*). The CASAC panel met at a public meeting on April 10, 2012, to review the draft ISA (77 FR 14783). Subsequently, on July 20, 2012, the CASAC provided a consensus letter for their review to the Administrator of the EPA (*http://yosemite.epa.gov/sab/sabproduct.nsf/13B1FD83815FA11885257A410064E0DC/$File/EPA-CASAC-12-005-unsigned.pdf*). The third external review draft ISA for Pb was released on November 27, 2012 (*http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=242655*). The CASAC panel met at a public meeting on February 5, 2013, to review the draft ISA (78 FR 938). Subsequently, on June 4, 2013, the CASAC provided a consensus letter for their review to the Administrator of the EPA (*http://yosemite.epa.gov/sab/sabproduct.nsf/0/39A3C8177D869EA085257B80006C7684/$File/EPA-CASAC-13-004+unsigned.pdf*). The letters from CASAC, as well as public comments received on the ISA drafts can be found in Docket ID No. EPA–HQ–ORD–2011–0051.

EPA has considered comments by the CASAC panel and by the public in prepering this final ISA.

Dated: June 18, 2013.

Abdel M. Kadry,

Acting Director, National Center for Environmental Assessment.

[FR Doc. 2013–15144 Filed 6–25–13; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OPP–2013–0380; FRL–9388–4]

Pesticide Maintenance Fee: Notice of Receipt of Requests to Voluntarily Cancel Certain Pesticide Registrations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: In accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), EPA is issuing a notice of receipt of requests by registrants to voluntarily cancel certain pesticide registrations. EPA intends to grant these requests at the close of the comment period for this announcement unless the Agency receives substantive comments within the comment period that would merit its further review of the requests, or unless the registrants withdraw its requests. If these requests are granted, any sale, distribution, or use of products listed in this notice will be permitted after the registration has been cancelled only if such sale, distribution, or use is consistent with the terms as described in the final order.

DATES: Comments must be received on or before December 23, 2013.

ADDRESSES: Submit your comments, identified by docket identification (ID) number EPA–HQ–OPP–2013–0380, by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the online instructions for submitting comments. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute.
- *Mail:* OPP Docket, Environmental Protection Agency Docket Center (EPA/DC), (28221T), 1200 Pennsylvania Ave. NW., Washington, DC 20460–0001.

Submit written withdrawal request by mail to: Information Technology and Resources Management Division (7502P), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460–0001. ATTN: Michael Yanchulis.

- *Hand Delivery:* To make special arrangements for hand delivery or delivery of boxed information, please follow the instructions at *http://www.epa.gov/dockets/contacts.htm.*

Additional instructions on commenting or visiting the docket, along with more information about dockets generally, is available at *http://www.epa.gov/dockets.*

FOR FURTHER INFORMATION CONTACT: Michael Yanchulis, Information Technology and Resources Management Division (7502P), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460–0001; telephone number: (703) 347–0237; email address: *yanchulis.michael@epa.gov.*

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

This action is directed to the public in general, and may be of interest to a wide range of stakeholders including environmental, human health, and agricultural advocates; the chemical industry; pesticide users; and members of the public interested in the sale, distribution, or use of pesticides.

B. What should I consider as I prepare my comments for EPA?

1. *Submitting CBI.* Do not submit this information to EPA through regulations.gov or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD–ROM that you mail to EPA, mark the outside of the disk or CD–ROM as CBI and then identify electronically within the disk or CD–ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

<u>Comment 1-1</u>

Our Rancho Cucamonga facility is one of only thirteen facilities that will be regulated by Proposed Rule 1420.2. As such, we have first-hand knowledge regarding the regulated equipment and activities, insight into the challenges of compliance, and potential environmental and economic impacts. We appreciate the opportunity to comment on the Draft Environmental Assessment prepared by the SCAQMD for Rule 1420.2. Our complete comments are attached.

<u>Response to Comment 1-1</u>
No response is necessary.

<u>Comment 1-2</u>

Our greatest concern during the rule development process has been that the rule would contain technologically or economically infeasible provisions that would not produce meaningful emissions reductions in the community. We appreciate the time that District staff has taken to better understand our equipment, emissions, and business. We believe that the August 5, 2015 version of the rule is better for the community as well as for Gerdau. However, the Draft EA evaluates an earlier version of the proposed rule. If provisions of earlier versions of the rule were to be restored, or new requirements added prior to rule adoption, the rule would very likely cause the closure of the Rancho Cucamonga facility. In such case, the Draft EA would be deficient under CEQA, because it fails to evaluate the substantial environmental effects of facility closure.

Again, we appreciate the opportunity to provide comments on the draft EA. If you have any questions regarding our comments, please do not hesitate to contact me.

<u>Response to Comment 1-2</u>
The Draft EA analyzed the June 12, 2015 version of PR 1420.2, which was the current version of the rule when the Draft EA was prepared. Through the public consultation process, the commenter provided comments to SCAQMD staff that some provisions such as the need to enclose slag handling and storage areas, the high in-draft velocity requirement for total enclosures, and the requirement to pave unpaved areas of the facility might lead to the closure of the commenter's facility. Since the June version of PR1420.2, SCAQMD staff has been working with stakeholders and has revised some of the provisions. The approach and core provisions requiring ambient monitoring of lead, the ambient lead concentration limits, lead point source requirements, requirements for operating within an enclosure, housekeeping and maintenance, and requirements for a compliance plan if certain thresholds are exceeded have not changed. In general, the revisions provided clarifications, provided other compliance options, or reduced the frequency of implementing specific provisions. As discussed in Chapter 2 of the Final EA, modifications to the proposed rule will not increase or create any new environmental impacts and in areas where the frequency of implementing certain housekeeping measures is reduced, will lessen certain environmental impacts; therefore the Draft EA provides a conservative analysis of the impacts of PR 1420.2. As proposed, PR 1420.2 does not include requirements which were in previous versions of the rule which would result in the foreseeable closure of the commenter's facility. As noted above, the revisions to the rule since the June 12, 2015 have lessened the facilities' requirements and as such any new rule language will not cause the commenter's facility to close.

<u>Comment 1-3</u>

1. <u>Version of the Rule Reviewed</u>

As originally proposed, Rule 1420.2 would have had a substantial negative effect on our plant in Rancho Cucamonga. Many of the requirements in the early versions of the rule would have been technologically infeasible. Other early provisions would have imposed extraordinary costs of compliance while having no or negligible benefit in reducing ambient lead concentrations in the community. As a result, the early versions of the rule would have caused the closure of the Rancho Cucamonga plant.

We realize that the staff continues to fine tune details regarding the proposed rule. Some of the issues described in our comments may be moot, with the release of the August 5, 2015 version of the rule, and others may become moot with additional rule revisions prior to adoption. However, to comment on the Draft EA, it is necessary to comment in the context of the version of the rule reviewed in that document. If the adopted version of the rule excludes provisions in the June 12, 2015 version of the proposed rule for which the Draft EA is deficient, then the CEQA deficiency may be addressed (provided the change does not implicate other potentially significant impacts). Conversely, if the adopted rule includes provisions that were present in the earlier drafts of the rule but not in the June 12, 205 version evaluated in the Draft EA, or if new requirements are added, then CEQA Guidelines Section 15073.5 would require at a minimum that the Draft EA be revised and recirculated for public comment prior to adoption of the rule in order to evaluate additional adverse environmental impacts, including direct and indirect environmental impacts associated with closure of the Ranch Cucamonga facility.

<u>Response to Comment 1-3</u>

The Draft EA analyzed the June 12, 2015 version of PR 1420.2, which was the current version of the rule when the Draft EA was prepared. Through the public consultation process, the commenter provided comments to SCAQMD staff that some provisions such as the need to enclose slag handling and storage areas, the high in-draft velocity requirement for total enclosures, and the requirement to pave unpaved areas of the facility might lead to the closure of the commenter's facility. Since the June version of PR1420.2, SCAQMD staff has been working with stakeholders and has revised some of the provisions. The approach and core provisions requiring ambient monitoring of lead, the ambient lead concentration limits, lead point source requirements, requirements for operating within an enclosure, housekeeping and maintenance, and requirements for a compliance plan if certain thresholds are exceeded have not changed. In general, the revisions provided clarifications, provided other compliance options, or reduced the frequency of implementing specific provisions. As discussed in Chapter 2 of the Final EA, modifications to the proposed rule will not increase or create any new environmental impacts and in areas where the frequency of implementing certain housekeeping measures is reduced, will lessen certain environmental impacts; therefore the Draft EA provides a conservative analysis of the impacts of PR 1420.2. As proposed, PR 1420.2 does not include requirements which were in previous versions of the rule which would result in the foreseeable closure of the commenter's facility. As noted above, the revisions to the rule since the June 12, 2015 have lessened the facilities' requirements and as such any new rule language will not cause the commenter's facility to close. SCAQMD staff has reviewed the modifications to PR 1420.2 and concluded that none of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15073.5.

Comment 1-4

2. The EA Should Be Revised to Evaluate the Current Proposed Rule.

As noted, the Draft EA analyzes the impacts of the June 12, 2015 version of the proposed rule. The proposed rule has been changed in important ways since that time. In order for the EA to achieve CEQA's objective of informing the public and the decision-makers about the environmental consequences of the proposed decision, the EA should be revised to include analysis of the latest version of the draft PR 1420.2. All edits made in the August 5, 2015 draft PR 1420.2 need to be reflected in an updated Project Description section of the EA. In addition, the environmental analysis needs to be updated to account for additional project components as listed in the August 5, 2015 draft proposed rule. EA revision should occur before either the EA or the rule is presented to the Governing Board for adoption. In addition, it is expected that changes in response to these and other public comments will disclose for the first time that the rule may result in significant adverse environmental impacts. Therefore, a revised draft EA should be recirculated for public comment before adoption of the EA or the rule.

Response to Comment 1-4

The Draft EA analyzed the June 12, 2015 version of PR 1420.2, which was the current version of the rule when the Draft EA was prepared. Since the June version of PR1420.2, SCAQMD staff has been working with stakeholders and has revised some of the provisions. The approach and core provisions requiring ambient monitoring of lead, the ambient lead concentration limits, lead point source requirements, requirements for operating within an enclosure, housekeeping and maintenance, and requirements for a compliance plan if certain thresholds are exceeded have not changed. In general, the revisions provided clarifications, provided other compliance options, or reduced the frequency of implementing specific provisions. As discussed in Chapter 2 of the Final EA, modifications to the proposed rule will not increase or create any new environmental impacts and in areas where the frequency of implementing certain housekeeping measures is reduced, will lessen certain environmental impacts; therefore the Draft EA provides a conservative analysis of the impacts of PR 1420.2. SCAQMD staff has reviewed the modifications to PR 1420.2 and concluded that none of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15073.5.

Comment 1-5

3. The EA Omits Impacts from the Most Significant Undertaking Required by the Rule: Construction of Gerdau's Meltshop/Baghouse.

The District acknowledges that Gerdau's Rancho Cucamonga facility will not be able to meet many of the requirements of the rule without completion of its meltshop/baghouse project. Yet the EA omits all discussion of the impacts of constructing and operating this project. Page 2-7 of the EA explains that the environmental analysis for the rule includes only impacts from installation of a negative air pressure system and increased housekeeping.

Response to Comment 1-5

As described on Page 2-7 of the Draft EA, the commenter's meltshop/baghouse project was previously analyzed under CEQA by the City of Rancho Cucamonga as the lead agency (Project File No.: Environmental Assessment and Conditional Use Permit DRC2008-00512) and, as a CEQA responsible agency, the SCAQMD issued air permits to construct on July 24, 2014, which was prior to the PR 1420.2 rulemaking process. Since the construction of the meltshop/baghouse was previously analyzed under a separate CEQA document and the permits to construct have been issued, SCAQMD staff found the construction of the meltshop/baghouse to be reasonably certain with or without PR 1420.2; therefore, SCAQMD staff considered the meltshop/baghouse as part of the CEQA baseline and did not include the impacts associated with the construction of the meltshop/baghouse in the Draft EA. The Draft EA focused on the additional measures that the facility would have to implement in order to comply with PR 1420.2, which included the installation of a negative air pressure system and increased housekeeping.

Comment 1-6

The Draft EA dismisses impacts from the meltshop/baghouse project because the project was initially proposed and permits to construct issued before Rule 1420.2 was proposed. Even so, Rule 1420.2 will fundamentally change the regulatory landscape for the company. Completion of the project will essentially be mandated by the rule, as the only other means of compliance would be to cease operations. CEQA precedents confirm that the change in legal status of even an ongoing activity can cause environmental impacts that must be reviewed in an EIR. See, e.g., *Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal. App. 4th 1170. Adoption or amendment of a regulation in recognition of the status quo can nonetheless require CEQA review because a change in enforceability can result in changes in the physical environment. The environmental impacts of a change in regulatory status are even more closely tied to the proposed rule here, where the meltshop/baghouse project has not yet been constructed, and progress on the project has been suspended since the District announced its intention to adopt proposed Rule 1420.2.

Response to Comment 1-6

The District has not "dismissed" impacts from the meltshop/baghouse project. As stated in the Draft EA, those impacts were analyzed under CEQA during the permitting process for that project. (See EA, p. 2-7.) The *Lighthouse Field Beach* case referenced by the commenter is distinguishable because that case involved a City's failure to conduct any analysis whatsoever of the referenced project – future permission for off-leash dog use at a beach. A future change of legal status associated with off-leash use was important only because it had the potential to trigger environmental impacts that had never been considered. In particular, the Court found that the granting of express permission for off-leash dog use might result in an increase of that use over and above any off-leash use already accounted for in the baseline. In contrast, any changes prompted by the adoption of Proposed Rule 1420.2 have been fully considered. More specifically, the meltshop/baghouse project and the associated construction impacts were expressly considered in an Initial Study and the Mitigated Negative Declaration (MND) prepared by the lead permitting agency, the City of Rancho Cucamonga. Further, SCAQMD already relied on this MND as a responsible agency when it approved the permits for the meltshop/baghouse project. Lastly, while Gerdau may have suspended the meltshop/baghouse project, it is SCAQMD staff's understanding that this suspension is temporary and that Gerdau intends to complete that project as originally planned provided PR 1420.2 is approved with the latest revisions.

Comment 1-7

Omission of the impacts of the meltshop/baghouse project also creates deficiencies in detailed analyses in the Draft EA. For example, the discussion of construction impacts (starting on pg.2-15 of the Draft EA) implies that construction of air pollution control devices for the compliance plan were assessed in the EA, but Gerdau's construction was omitted. Also, the EA states that construction impacts will not overlap between facilities: "Given the short duration of construction and the amount of time for facilities to comply with PR 1420.2, staff assumed that the construction phases at these different facilities would not overlap (pg. 2-17)." However, this assumption does not take into account the lengthy construction schedule for the Gerdau's meltshop/baghouse project. In Appendix B of the Draft EA, the construction phase of the air pollution control devices is listed as only 21 days. Thus, it is quite possible that, on a peak-day, construction of the meltshop/baghouse project will overlap with construction by other facilities subject to proposed Rule 1420.2. The schedule that Gerdau has previously submitted to the District shows that construction of the meltshop/baghouse project will take approximately two years, not a few days.

Similarly, the EA analyzes only 54 days of construction of a total enclosure, while Gerdau's construction will require additional months following completion of the new baghouse. The EA also severely underestimates the size of the assumed enclosure, analyzing only 31,250 square feet of enclosure compared to the 285,000 feet proposed for Gerdau's project.

Response to Comment 1-7

As described on Page 2-7 of the Draft EA, the commenter's meltshop/baghouse project was previously analyzed under CEQA by the City of Rancho Cucamonga as the lead agency (Project File No.: Environmental Assessment and Conditional Use Permit DRC2008-00512) and, as a CEQA responsible agency, the SCAQMD issued air permits to construct on July 24, 2014, which was prior to the PR 1420.2 rulemaking process. Since the construction of the meltshop/baghouse was previously analyzed under a separate CEQA document and the permits to construct have been issued, SCAQMD staff found the construction of the meltshop/baghouse to be reasonably certain with or without PR 1420.2; therefore, SCAQMD staff considered the meltshop/baghouse as part of the CEQA baseline and did not include the impacts associated with the construction of the meltshop/baghouse in the Draft EA.

As discussed in Section III.c) on Page 2-21 of the Draft EA, "criteria pollutant project-specific air quality impacts from implementing PR 1420.2 would not exceed air quality significance thresholds (Error! Reference source not found.), cumulative impacts are not expected to be significant for air quality. SCAQMD cumulative significance thresholds are the same as project-specific significance thresholds. Therefore, potential adverse impacts from implementing the proposed rule would not be "cumulatively considerable" as defined by CEQA Guidelines §15064(h)(1) for air quality impacts. Per CEQA Guidelines §15064(h)(4), the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulative considerable." Therefore, it is not necessary to evaluate the overlapping emissions from the construction of Gerdau's meltshop/baghouse with the construction emissions for rule compliance.

The enclosures to be built were assumed to be for two other facilities (Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) and Liberty Manufacturing (referred to as Facility L in Table B-10 in Appendix B of the Draft EA) and the size of the total enclosure was estimated based on a review of satellite photographs and locations of the processes to be enclosed. At the time of analysis, SCAQMD staff analyzed the rule requirements and found that these would be the only two facilities which would need to build a total enclosure solely to comply with PR 1420.2. Based on facility site visits performed by SCAQMD staff and the current rule requirements, SCAQMD staff now finds that only one facility (Atlas Pacific Corp) will require the construction of a total enclosure; therefore the construction analysis contained in the Draft EA is conservative.

Comment 1-8

If the District continues to exclude Gerdau's meltshop/baghouse project from the proposed Rule 1420.2 impact analysis, at a minimum the project must be included in the cumulative impacts analysis for both air quality and greenhouse gas impacts. Gerdau's meltshop/baghouse project will overlap with implementation of other construction required to comply with Rule 1420.2. As noted above, the cumulative impacts would be significant for air quality and require preparation of Environmental Impact Report (EIR).

Response to Comment 1-8

As discussed in Section III.c) on Page 2-21 of the Draft EA, "criteria pollutant project-specific air quality impacts from implementing PR 1420.2 would not exceed air quality significance thresholds (Error! Reference source not found.), cumulative impacts are not expected to be significant for air quality. SCAQMD cumulative significance thresholds are the same as project-specific significance thresholds. Therefore, potential adverse impacts from implementing the proposed rule would not be "cumulatively considerable" as defined by CEQA Guidelines §15064(h)(1) for air quality impacts. Per CEQA Guidelines §15064(h)(4), the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulative considerable." Because PR 1420.2 will not have any significant environmental impacts, cumulative or otherwise, an EIR is not necessary pursuant to CEQA Guidelines §15070.

Comment 1-9

4. The EA Must Evaluate Environmental Impacts Resulting from Economic Impacts.

CEQA Guidelines Section 15131 provides:

> Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

As explained above, the pre-June 12, 2015 versions of the rule contained provisions that would have been technologically or economically infeasible, and would have resulted in the closure of the Rancho Cucamonga facility. For example, it likely would be technologically infeasible to achieve the point source control efficiency required by Subsection (f) for small point sources with low concentrations of lead in the exhaust. Even if achievable, this requirement would have resulted in no measurable benefit in the community, at great expense. Similarly, pre-June versions of the rule would have required total enclosure of handling and storage of lead-containing materials, including slag. For Gerdau, this would have required construction of total enclosure for our lead handling and slag storage area, which currently spans approximately 12.4 acres. The cost of construction of such an enclosure would have been many millions of dollars, and it could not have been completed within the time frame specified. Testing has shown that our slag has a lead content within the range of naturally occurring soils in California, so this expense would not have produced a meaningful reduction in lead concentrations in the community.

The June 12, 2015 version of the rule likewise contained a number of provisions that were technologically, economically or legally infeasible. If adopted, these provisions would result in the closure of the Rancho Cucamonga plant. This consequence will be discussed in greater detail in our comments on the proposed rule and the Draft Socio-economic Report.

CEQA does not require the EA to discuss the direct economic impact to the company or the community from the closure. But facility closure would cause substantial environmental effects in the immediate vicinity, in the region, and beyond. These impacts must be discussed in the EA if any of the above-listed provisions is contained in the final rule as adopted.

The Rancho Cucamonga facility is a major employer and contributor to the local economy, and its closure could set in motion localized environmental impacts considered blight or urban decay. Vacancy of a major business or structure can trigger a downward spiral of other business closures and long-term vacancies. In CEQA, "urban decay" is generally defined as visible symptoms of physical deterioration that invite vandalism, loitering, and graffiti. Urban decay may include boarded doors and windows, deferred maintenance of structures, unauthorized use of buildings and parking lots, littering, dead or overgrown vegetation, and third party dumping of refuse. Thus, Comment 1-9 (continued)

a deteriorating economic condition may cause deterioration of the physical conditions. These changes in the physical environment would be adverse environmental impacts that must be evaluated under CEQA.

The Draft EA would also need to evaluate the alternative scenario of removal of the facility to avoid blight. There would be substantial environmental impacts associated with dismantling the facility. These include engine emissions from demolition equipment and off-road and on-road motor vehicles, including vehicles removing waste from the site. It also would include fugitive emissions associated with demolition and vehicular travel on the site.

Many of our employees are highly skilled and highly compensated workers. But the Rancho Cucamonga facility is the last remaining steel mill in California; therefore, their skills may not match the requirements of other employers in the immediate vicinity. Closure of the plant may initiate an extended period during which the employees drive substantial additional miles looking for new employment. An increase in vehicle miles traveled translates into additional traffic and air quality impacts that would need to be quantified and evaluated in the Draft EA.

On the regional, statewide and global levels, closure of the Rancho Cucamonga facility would affect major market chains, including waste management, metals recycling, and the production of seismic rebar, with consequential environmental impacts. The Rancho Cucamonga facility receives scrap metal from sources throughout Southern California. (Approximately 90% comes from sources within 75 miles of the plant, 6% from sources between 75-125 miles, and the remainder from sources more than 125 miles, including small amounts from Arizona and Nevada.) The plant recycles the scrap metal to produce seismic rebar needed for construction in California. Loss of this facility would cause dislocation in construction, demolition, and metals recycling, manufacturing and supply.

These dislocations would directly cause environmental impacts. Scrap metal would have to be hauled longer distances. Because there is no other steel mini-mill in California, the scrap metal would have to be hauled out of state or out of the country. Given our knowledge of the metals industry, we believe the most likely outcome is that the scrap metal would be hauled by truck or train to the Ports of Los Angeles or Long Beach, transshipped onto marine vessels, and transported to Asia. There, it would be recycled into new steel products. This may or may not include seismic rebar, depending upon the market interests of the scrap purchaser or recycler. In any event, California's need for seismic rebar would need to be met by manufacturers outside California. Thus, the CEQA analysis would need to include the substantial traffic, transportation, air emissions and other impacts associated with transporting the scrap out of California, and transporting seismic rebar into the state. In addition, given California's groundbreaking regulation of greenhouse gas emissions, it is most likely that recycling the scrap metal and manufacturing the seismic rebar outside the state will produce much greater greenhouse gas emissions than baseline emissions for these same activities.

Our air quality expert, Joseph Hower of Ramboll Environ US Corporation, prepared a simple air quality analysis assuming that the work and the Rancho Cucamonga facility would shift to an existing facility in Arizona. Even under this scenario, air emissions impacts of closing the Rancho Cucamonga facility would be significant, as shown in Table 1 below:

Comment 1-9 (continued)

Table 1. Emissions Increase due to Transportation of Scrap Metal and Final Product in the event of Shutdown of the Gerdau TAMCO Facility

Parameter	Delivery Trucks to and from Nucor Plant in Arizona	Delivery Trucks to and from TAMCO	Increase from TAMCO Steel Mill Shutdown
Vehicle Miles Travelled (miles/day)[1]			
Total VMT	141,823	44,738	97,085
Criteria Air Pollutant Emissions (lb/day)[2]			
NO_x	1,934	610	1,324
CO	382.3	120.6	261.7
PM_{10}	60.6	19.1	41.5
$PM_{2.5}$	39.1	12.3	26.7
SO_x	5.2	1.6	3.5
VOC	75.2	23.7	51.5
Greenhouse Gas Emissions (MT/yr)[3]			
CO_2	85,215	26,881	58,334
CH_4	0.6	0.2	0.4
N_2O	2.9	0.9	2.0
Total GHG[4]	86,127	27,169	58,958

Notes:

[1] Project VMT were estimated by multiplying the 2013 VMT by the production rate scaling factor.

[2] Criteria pollutant emissions were estimated using the VMT in SCAB.

[3] Greenhouse gas emissions were estimated using the VMT in California.

[4] Calculated using the following global warming potentials from the Intergovernmental Panel on Climate Change Second Assessment Report. Available at http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14, Accessed August, 2014.

As noted above, the more likely outcome would be a shift in the scrap and manufacturing to Asia, resulting in air emissions far greater than those in Table 1.

Given the magnitude of all these impacts, a full environmental impact report would likely be required.

Response to Comment 1-9

The proposed rule has been revised since the release of the Draft EA based on SCAQMD staff's work with the affected facilities, including Gerdau. It is the SCAQMD staff's understanding based on various conversations with representatives from Gerdau that revisions to Proposed Rule 1420.2 have addressed all the facilities' concerns and that the facility no longer believes closure is reasonably foreseeable. SCAQMD staff has made a number of revisions to Proposed Rule 1420.2 to address concerns raised by Gerdau such as, but not limited to, extending the compliance date for the total enclosure with negative air from July 2017 to April 2018, revising requirements for storing slag, reducing the inward face velocity for openings in total enclosures with negative air from 300 to 200 feet per minute, and allowing a 15 minute rolling average for demonstrating compliance with differential pressure monitoring for total enclosures with negative air. As proposed, PR 1420.2 does not impose requirements that would make facility closure reasonably foreseeable. Because the revised rule does not contain requirements that are technologically or economically infeasible and facility closure is not reasonably foreseeable, CEQA does not require the analysis of indirect environmental impacts associated with facility closure. Therefore, the direct and indirect impacts from facility closure do need to be analyzed in the Final EA.

Comment 1-10

5. The Draft Relies Excessively on Unsubstantiated Assumptions.

Many conclusions in the Draft EA are based on nothing more than staff impressions with no supporting information. There are several variations on unsupported conclusions:

- For some impact topics, where the rule allows two or more compliance options, the Draft EA analysis seems to assume only one of the options will be followed, and ignores the impacts associated with the other option(s). For example Subsection (h)(5) of the rule requires that all materials capable of generating any amount of fugitive lead dust, including slag, be stored in sealed, leak-proof containers, located within a total enclosure, or stabilized using dust suppressants. The Draft EA does not appear to evaluate any impacts (e.g., construction air emissions, conflict with land use zoning and other restrictions, stormwater runoff from additional impermeable surfaces) associated with fully enclosed storage of slag. If the analysis in the Draft EA is based on the assumption that all regulated companies will use the dust suppressant compliance option, this assumption should be clearly stated. Alternatively, the Draft EA should evaluate the impacts associated with construction and operation of full enclosure of slag.

Response to Comment 1-10

Where there were multiple options for compliance, SCAQMD staff analyzed the impacts associated with the option that each facility would likely choose, based on SCAQMD staff's understanding of the affected facilities. The Draft EA evaluated the most conservative assumptions that are foreseeable at the 13 existing affected facilities to ensure compliance with provisions of PR 1420.2 for all the environmental topics. For future facilities, PR 1420.2 will be adopted and the facilities will need to consider the various requirements for rule compliance and undergo CEQA review when applying for their air quality permits.

With respect to the portion of the comment referring to provision (h)(5) of PR 1420.2, that provision provides for an alternative to the construction of a total enclosure for storage of slag. In particular, it allows facilities to choose other options such as using sealed, leak-proof containers or stabilization using dust suppressants. This provision of Proposed Rule 1420.2 was modified/included to allow use of dust suppressants based on comments from Gerdau. In addition, Proposed Rule 1420.2 also allows use of dust suppressants during transport of slag, as requested by Gerdau. It is the SCAQMD staff's understanding that Gerdau intends to comply with paragraphs (h)(5) and (h)(6) using dust suppressants based on meetings and correspondence with representatives of Gerdau and SCAQMD staff. Since Gerdau is currently applying dust suppressants to their slag piles, the environmental impacts associated with complying with this rule provision are included in the CEQA baseline. Furthermore, based on a review of operations at the other 12 affected facilities, none of the facilities would need to apply dust suppressants in order to comply with this provision in PR 1420.2. Therefore, there are no new environmental impacts associated with this rule provision which have not been evaluated in the Draft EA.

With respect to the enclosure option, the most conservative assumption for the slag handling and storage provision would be to assume that all facilities would construct total enclosures. However, based on SCAQMD staff review of the operations at the affected facilities, it was found that most of these facilities would be able to comply with this rule provision without the need for construction of a total enclosure. The Draft EA conservatively assumed that two facilities (Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) and Liberty Manufacturing (referred to as Facility L in Table B-10 in Appendix B of the Draft EA)) would construct total enclosures. With the current revisions to PR 1420.2, only one facility (Atlas Pacific Corp) would need to construct a total enclosure to comply with PR 1420.2.

Comment 1-11

- For some impact topics, where there is a potential exemption from the rule, the analysis appears to assume that the exemption will apply to all companies and their activities that would otherwise be regulated, and the Draft EA does not discuss the impacts of any compliance actions whatsoever. For example, the Draft EA appears to assume that all slag handling will be exempt from the sealed container requirement in Subsection ___, because it does not consider construction or operational impacts associated with totally enclosed slag conveyance systems handling hot slag.

Response to Comment 1-11

Where there were potential exemptions, SCAQMD staff analyzed the impacts associated with the option that each facility would likely choose in order to comply with PR 1420.2, based on SCAQMD staff's understanding of the affected facilities. In the commenter's example, SCAQMD staff did not assume that all slag handling would be exempt, but that most of the facilities already comply with the rule provisions based on its understanding of each facility's operations; therefore, their compliance activities would be considered to be in the CEQA baseline and no environmental impacts would result from PR 1420.2. Additionally, the Draft EA conservatively assumed that two facilities (Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) and Liberty Manufacturing (referred to as Facility L in Table B-10 in Appendix B of the Draft EA)) would construct total enclosures in order to comply with this provision of PR 1420.1. With the current revisions to PR 1420.2, only one facility (Atlas Pacific Corp) would need to construct a total enclosure to comply with PR 1420.2. Therefore, the Draft EA evaluated the most conservative assumptions that are foreseeable at the 13 existing affected facilities to ensure compliance with provisions of PR 1420.2. For future facilities, PR 1420.2 will be adopted and the facilities will need to consider the various requirements for rule compliance and undergo CEQA review when applying for their air quality permits.

Comment 1-12

- Some assumptions are articulated but the basis for the assumptions are not documented, or the assumptions are not supported with references to relevant data or technical references demonstrating the reasonableness of the assumptions. The Draft EA makes broad and unsubstantiated assumptions regarding zoning, land use, and noise ordinances, among others. In many cases, it would be fairly simple to obtain accurate information or data rather than making broad, unsupported assumptions, yet the Draft EA makes no effort to do so. For example, the discussion of Questions XII. d) and XVII. c) in the Checklist state that it is not known whether the regulated facilities are in an airport land use plan or within two miles of a public airport. The District expects the rule to affect thirteen known facilities at thirteen known locations. (DEA, p. 1.6). Given the known locations of the facilities and of the region's airports, it would be a straightforward task to locate this information. Similarly, it would be a simple matter to determine how the requirements of the rule would be treated under local zoning, land use and other ordinances regulating landscaping, aesthetics, building heights, noise and other parameters in the relevant cities and counties. The Draft EA fails to do so.

Given the very small number of sources regulated by the rule, the Draft EA's failure to provide meaningful detail is contrary to CEQA's requirements for public disclosure and opportunity to comment.

Response to Comment 1-12
Respecting the commenter's concern about aesthetic impacts, the Draft EA already considers the potential impact from minor facility modifications that could impact aesthetics due to the rule (these modifications do not include the meltshop/baghouse project at Gerdau as this project has previously been approved and is part of the CEQA baseline). In particular, page 2-11 of the Draft EA states "Since PR 1420.2 affects operations on-site at existing facilities in industrial areas, any new construction at these facilities is expected to be similar to existing buildings or other structures".

Respecting potential airport impacts, on Page 2-35 of the Draft EA, the analysis states that "Two of the facilities are located within two miles of a public airport." Senior Aerospace is located approximately 0.6 miles east of the Burbank Airport but is not located within the airport influence area. Teledyne Battery Products is located approximately 1.7 miles southeast of the San Bernardino International Airport but is not within the airport safety review area. At the commenter's request, this clarifying information has been updated in Section XII.d) on Page 2-43 and in Section XVII.c) on Page 2-51 of the Final EA, but does not provide new information or affect the analysis and significance determination of the Draft EA.

Regarding potential land use and zoning impacts, the Draft EA already considers the potential impact from minor facility modifications that could impact land use due to the rule (these modifications do not include the meltshop/baghouse project at Gerdau as this project has previously been approved and is part of the CEQA baseline). In particular, the Draft EA already stated on Page 2-41 that the potential facility modifications will not divide an established community because any facility modifications will occur onsite or will be so minor that they will not affect any land use plans, policies, or regulations, including any zoning or building height provisions. For example, the likely construction of an enclosure at Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) would be consistent with the land use policies, regulations, building height requirements, and zoning of the Agua Mansa Specific Plan and General Plan for the city of Rialto.

Regarding potential noise impacts, the Draft EA already considers the potential impact from minor facility modifications that could impact noise due to the rule (these modifications do not include the meltshop/baghouse project at Gerdau as this project has previously been approved and is part of the CEQA baseline). As stated on Page 2-43 of the Draft EA, construction activities are anticipated to have the potential for the most noise impacts, but these would be indistinguishable from surrounding background noise found in the industrial areas where all facilities making modifications pursuant to PR 1420.2 are located, and are thus less than significant.

Comment 1-13

Page	Comment
1-2	**Introduction**: The text states that the rule will reduce "the further accumulation of lead dust in and around these" metal melting facilities. The Draft EA does not provide any evidence that accumulation has occurred or is occurring in and around these facilities. Therefore, the Draft EA should not take credit for such reductions in evaluating the effects of the rule.

Response to Comment 1-13

In the prior statement in the Draft EA, the purpose of Rule 1420.2 is "to reduce lead emissions from metal melting facilities by limiting the ambient lead concentration and requiring housekeeping and maintenance provisions to reduce the amount of lead emitted into the air from point and fugitive sources". Through atmospheric deposition, lead dust generated at facilities will necessarily deposit on the soil in the vicinity of the facility and will accumulate over time. Lead is an element which does not decompose and SCAQMD monitoring data has shown elevated levels of lead at source-oriented monitors placed at Trojan Battery and Gerdau, which substantiates the statement that lead accumulation on surfaces is expected in the vicinity of these lead sources.

Comment 1-14

1-2	**Project Location:** The text following this heading describes the entire South Coast Air Basin and portions of the Salton Sea and Mojave Desert Air Basins. The inference is that this entire area is the Project Location. This is misleading in that the rule affects specifically 13 facilities that have been identified by the SCAQMD. As summarized in EPA's Integrated Science Assessment (ISA; see 78 Fed.Reg. 38318, June 26, 2013), "Since the phase-out of Pb in on-road gasoline, Pb is widely recognized as a source-oriented air pollutant. Variability in air Pb concentrations is highest in areas including a Pb source, with high concentrations downwind of the sources and low concentration at areas far from sources." (80 Fed.Reg. 278, 283, January 5, 2015.) This means that lead emission reductions from the rule will have an effect near the source but there will be no measurable change in the SCAB as whole.

Response to Comment 1-14

The project location section of the Draft EA describes SCAQMD's jurisdiction. A description of the 13 facilities affected by PR 1420.2 was included on Page 1-6 of the Draft EA. This proposed rule would also affect any potential new facility that meets the proposed rule's applicability provisions. As such, the project location section appropriately described the entire SCAQMD jurisdiction because a new facility could choose to locate its operations anywhere within the entire jurisdiction of SCAQMD.

Comment 1-15

Presenting the project area as the entire SCAB and portions of two more basins causes deficiencies in the EA. The Draft EA fails to present relevant information about the existing environment in the vicinity of the 13 regulated facilities. The SCAQMD's network of ten non-source oriented monitors shows ambient concentrations in 2007 to 2013 "well below the 2008 NAAQS for lead of 0.15 $\mu g/m^3$," ranging from 0.01 to 0.03 $\mu g/m^3$. (Preliminary Draft Staff Report dated April 2015, p. 1-7.) Information is presented in the April 2015 Staff Report regarding fence-line monitoring for the Gerdau/Tamco facility, but even for this facility there is no information presented in the Staff Report or the Draft EA about ambient lead levels in the surrounding community. Information is presented in the Draft Staff Report about Trojan Battery, but it the text does not disclose whether the measurements are taken at the fenceline or in the community. Without relevant information regarding the environmental setting, it is impossible to accurately assess the effects of the rule.

Response to Comment 1-15

A more robust discussion of the lead monitoring data can be found in the Staff Report for PR 1420.2. The analysis in the Draft EA did not rely on the monitoring data in the environmental impact analysis or CEQA significance determinations and the Draft EA was not deficient in this regard. However, at the request of the commenter, additional information on the recent monitoring data has been included beginning on Page 1-6 in the Final EA.

Comment 1-16

1-4	**Health Effects of Lead:** The Draft EA references and quotes a few selective phrases from U.S. EPA documents to create the misleading impression that there is substantial doubt and uncertainty regarding a health protective lead exposure level to ensure young children do not experience nervous system effects including cognitive effects. Selective quotes suggest that the federal NAAQS of 0.15 μg/m³ is not health protective for young children. In fact, EPA's January 5, 2015 Federal Register Notice clearly explains that the agency proposes to retain the 0.15 μg/m³ primary NAAQS because it will protect the public welfare from any known or anticipated adverse effects associated with the presence of lead in the ambient air, including an adequate margin of safety to address uncertainties and a reasonable degree of protection against hazards that research has not yet even identified. (80 Fed.Reg. 278 *et seq.*) EPA also stated that when a standard of a particular level is just met at a monitor sited to record the highest source-oriented concentration in an area, the large majority of children in the surrounding area would likely experience exposures to concentrations well below that level. (80 Fed.Reg at 287.) The misleading presentation of EPA's research and conclusions taints the Draft EA's discussion of the environmental and regulatory setting, as well as the policy decisions reflected in the rule. The EPA's work should be presented more fully and accurately in the EA.

Response to Comment 1-16

A more robust discussion of the health effects of lead can be found in the Staff Report for PR 1420.2. The analysis in the Draft EA did not rely on the subject information in the environmental impact analysis or CEQA significance determinations. However, at the request of the commenter, additional information about the health effects of lead has been added on Page 1-4 of the Final EA.

Comment 1-17

1-6	**Table 1-1:** The SIC codes presented in this table do not correspond to the NAIC codes used on pages 1-8 to 1-16, making it difficult for the reader to follow the descriptions of the regulated companies and the Project Description. References should be standardized. Both Table 1-1 and the discussion on pages 1-8 to 1-16 would be improved by identifying the facilities by name. Naming the facilities would also aid the reader in reviewing assumptions regarding construction and other actions required for compliance, to confirm the accuracy of emissions estimates and other impact analyses.

Response to Comment 1-17

Table 1-1 lists the facilities by their SIC codes for informational purposes. In order to be consistent with the descriptions of facilities starting on Page 1-13 of the Final EA, Table 1-1 has been replaced with a table showing the corresponding NAICS codes. Furthermore, the names of facilities have been added in the various discussion sections of the Final EA, when the identification of the specific facility is relevant to the discussion and analysis of environmental impacts.

Comment 1-18

1-10	**Process Emission Points and Controls:** Gerdau strongly disagrees that transfer, handling and storage of slag can be a source of fugitive lead dust emissions. Gerdau has submitted test data to the District showing that the lead content of its slag is within the range of lead concentration present in native soils in California. The EA does not present any data supporting its statement that slag is a source of lead emissions. As such, the EA misrepresents the environmental setting for the project. This in turn results in the EA attributing emissions benefits to implementation of the rule.

Response to Comment 1-18

The transfer, handling, and storage of slag is one of the processes that occurs at the affected facilities. While the commenter has submitted source test information regarding the lead content of the slag at its facility, those results might not be indicative of the slag handled at other facilities. Based on visual inspection at the various affected facilities, SCAQMD staff identified the transfer, handling, and storage of uncovered slag as a potential source of fugitive emissions and proposed provisions in PR 1420.2 to control those emissions. The SCAQMD staff reviewed the data regarding samples taken from Gerdau's slag. Based on review of the data there is lead in the slag. As Gerdau is aware, provisions of Proposed Rule 1420.2 were modified for the storage and transport of slag based on information provided from Gerdau. The proposed rule allows the use of dust suppressants or total enclosures and other closed transportation systems for the storage and transport of slag. The analysis in the Draft EA did not quantify the reductions from the transfer, handling, and storage of slag and did not take credit for those reductions.

Comment 1-19

1-17	**Applicability:** The EA states that data from SCAQMD monitors at two metal mantling facilities have shown the potential for this source category to exceed the NAAQS lead limit of 0.15 $\mu g/m^3$ averaged over a rolling 3 month period. This statement does not accurately reflect the data. At least with respect to data gathered at TAMCO/Gerdau, monitoring occurred on the grounds of the facilities, near the fenceline. Monitoring did not occur in the ambient air as defined for purposes of compliance with the federal NAAQS. By overstating data regarding the lead concentrations in the existing setting, the EA in turn attributes environmental benefits to implementation of the proposed rule. In this regard, it also should be noted that the definition of ambient air in the proposed rule does not conform to federal definitions. This should be fully explained in the EA so that the public is not misled by quotes from federal documents taken out of context.

Response to Comment 1-19

A more robust discussion of the lead monitoring data can be found in the Staff Report for PR 1420.2. The analysis in the Draft EA did not rely on the monitoring data in the environmental impact analysis or CEQA significance determinations. However, at the request of the commenter, additional information on the recent monitoring data has been included beginning on Page 1-6 in the Final EA.

For the purposes of this rule, ambient air will refer to any outdoor air which is similar to the California Air Resources Board definition rather than the federal definition. It should also be noted that the proposed rule and the 2008 NAAQS for lead requires compliance with ambient air lead standards based on facility emissions that contribute to exceedances, with facility emissions not having to be the sole cause.

Comment 1-20

2-6	**Discussion and Evaluation of Environmental Impacts:** Paragraph 3 states that the CEQA analysis assumes a worst case scenario where facilities are expected to do further actions to meet the core requirements of the proposed rule, or additional controls as part of a compliance plan. However, as noted in Part I of these comments, the analysis omits all impacts associated with Gerdau's construction and operation of its meltshop/baghouse project. In addition, the analysis omits impacts associated with the potential closure of the Gerdau facility if the rule as analyzed in the EA were to be promulgated. As such, the EA fails to evaluate all impacts associated with the proposed rule.

Response to Comment 1-20

As described on Page 2-7 of the Draft EA, the commenter's meltshop/baghouse project was previously analyzed under CEQA by the City of Rancho Cucamonga as the lead agency (Project File No.: Environmental Assessment and Conditional Use Permit DRC2008-00512) and, as a CEQA responsible agency, the SCAQMD issued air permits to construct on July 24, 2014, which was prior to the PR 1420.2 rulemaking process. Since the construction of the meltshop/baghouse was previously analyzed under a separate CEQA document and the permits to construct have been issued, SCAQMD staff found the construction of the meltshop/baghouse to be reasonably certain with or without PR 1420.2; therefore, SCAQMD staff considered the meltshop/baghouse as part of the CEQA baseline and did not include the impacts associated with the construction of the meltshop/baghouse in the Draft EA. The Draft EA focused on the additional measures that the facility would have to implement in order to comply with PR 1420.2, which included the installation of a negative air pressure system and increased housekeeping.

The rule has been revised since the release of the Draft EA based on SCAQMD's staff's work with the affected facilities, including Gerdau. It is the SCAQMD staff's understanding based on various conversations with representatives from Gerdau that revisions to Proposed Rule 1420.2 have addressed all the facilities' concerns and that the facility no longer believes closure is reasonably foreseeable. SCAQMD staff has made a number of revisions to Proposed Rule 1420.2 to address concerns raised by Gerdau such as, but not limited to, extending the compliance date for the total enclosure with negative air from July 2017 to April 2018, revising requirements for storing slag, reducing the inward face velocity for openings in total enclosures with negative air from 300 to 200 feet per minute, and allowing a 15 minute rolling average for demonstrating compliance with differential pressure monitoring for total enclosures with negative air. As proposed, PR 1420.2 does not impose requirements that would make facility closure reasonably foreseeable. Because the revised rule does not contain requirements that are technologically or economically infeasible and facility closure is not reasonably foreseeable, CEQA does not require the analysis of indirect environmental impacts associated with facility closure. Therefore, the direct and indirect impacts from facility closure do need to be analyzed in the Final EA.

Comment 1-21

2-7	**Discussion and Evaluation of Environmental Impacts:** The text at the top of the page suggests that most facilities are expected to meet point source requirements in the rule. Table 2-3 on page 2-16. In fact, the EA assumes that ***no*** construction of point source controls will be required, and so attributes no impacts to this portion of the rule. The EA should be more explicit in stating the assumptions underlying its analysis and conclusions. The EA also should explain the basis for assuming that no additional point source controls will be required. For example, the EA might explain that point sources not already equipped with air pollution control devices are expected to be exempt through other provisions of the rule.

Response to Comment 1-21

A provision was added to Proposed Rule 1420.2 that allows low emitting lead sources with an inlet or uncontrolled lead emission rate of 0.005 lb/hour or less to be exempt from demonstrating a control efficiency of 99 percent as required in subdivision (f), provided the facility conducts a source test every 24 months. The Draft EA provided specific assumptions used for lead point source controls in Table 2-1, stating that "all 13 facilities currently have point source emission controls" and that five facilities would likely need to replace the filter media in their existing control devices.

Comment 1-22

	In addition, the proposed rule contains many requirements that are not addressed in the assumptions presented on pages 2-6 to 2-7. For example, the explanation of assumptions does not address the requirements for total enclosure of materials storage areas, including slag storage. If the EA is based on the assumption that no construction or operation is required because all regulated facilities will use dust suppressants on slag piles and handling of hot slag will be exempt, this must be stated clearly in the EA.

Response to Comment 1-22

This comment is referring to provision (h)(5) of PR 1420.2, which does not require the construction of a total enclosure for storage of slag, but allows facilities to choose other options such as using sealed, leak-proof containers or stabilization using dust suppressants. PR 1420.2 was modified to allow use of dust suppressants based on comments from Gerdau. In addition, PR 1420.2 also allows use of dust suppressants during transport of slag, as requested by Gerdau. It is the SCAQMD staff's understanding that Gerdau intends to comply with paragraphs (h)(5) and (h)(6) using dust suppressants based on meetings and correspondence with representatives of Gerdau and SCAQMD staff. Currently, Gerdau is applying dust suppressants to their slag piles; therefore, the environmental impacts associated with complying with this rule provision are included in the CEQA baseline. Furthermore, based on a review of operations at the other 12 affected facilities, none of the facilities would need to apply dust suppressants in order to comply with this provision in PR 1420.2. Therefore, there are no new environmental impacts associated with this rule provision which have not been evaluated in the Draft EA.

Based on SCAQMD staff review of the operations at the affected facilities, it was found that most of these facilities would be able to comply with the rule provision related to materials storage areas, including slag storage, without the need for construction of a total enclosure. The Draft EA conservatively assumed that two facilities (Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) and Liberty Manufacturing (referred to as Facility L in Table B-10 in Appendix B of the Draft EA)) would construct total enclosures. With the current revisions to PR 1420.2, only one facility (Atlas Pacific Corp) would need to construct a total enclosure to comply with PR 1420.2. Therefore, the Draft EA evaluated the most conservative assumptions that are foreseeable at the 13 existing affected facilities to ensure compliance with provisions of PR 1420.2 for all the environmental topics. For future facilities, PR 1420.2 will be adopted and the facilities will need to consider the various requirements for rule compliance and undergo CEQA review when applying for their air quality permits.

Comment 1-23

2-8/9	**Table 2-1:** The table does not list Transportation as an *Environmental Topic to be Analyzed* for Total Enclosures or Compliance Plan. Because Total Enclosures will need to be constructed for two facilities and the Compliance Plan requirement of the PR 1420.2 is expected to result in construction of new air pollution control devices, construction activities will involve additional vehicle trips to the applicable site. This should be captured in the transportation analysis and listed in the *Environmental Topic to be Analyzed* column of Table 2-1.

Response to Comment 1-23

Transportation impacts associated with construction of the enclosures at the two facilities and compliance plan requirements were analyzed in the Draft EA. In response to this comment, “Transportation” will be added to Table 2-1 for “Total Enclosures” and “Compliance Plan” in the Final EA.

Comment 1-24

2-10 to 2-11	**Aesthetics:** The Draft EA dismisses the topic of aesthetic impacts with the observation that the 13 regulated facilities are located in urbanized industrial or commercial areas. This is not sufficient under CEQA. Aesthetic issues can be of particular interest to neighbors in highly urbanized settings. In addition, requirements for total enclosure of slag handling and storage could result in the construction of new conveyor systems and tall new walls that would be visible from a distance. There are only 13 regulated facilities. The EA should more specifically describe the setting of the 13 facilities, and provide a meaningful, supported explanation for the conclusion that there will be no significant aesthetic impacts.

Response to Comment 1-24

Based on correspondences and meetings with Gerdau representatives, it is SCAQMD staff’s understanding that Gerdau intends to use dust suppressants in lieu of constructing any type of structures to comply with transport and storage of slag. As previously discussed in Response to Comment 1-10, the proposed rule added the option to use dust suppressants based on comments from Gerdau and information regarding the lead content in their slag. The Draft EA conservatively assumed that two facilities (Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix

B of the Draft EA) and Liberty Manufacturing (referred to as Facility L in Table B-10 in Appendix B of the Draft EA)) would construct total enclosures. With the current revisions to PR 1420.2, only one facility (Atlas Pacific Corp) would need to construct a total enclosure to comply with PR 1420.2. Atlas Pacific Corp is located in an industrial area in the city of Rialto in San Bernardino County and is surrounded by a tilt-up concrete warehouse building to the north, a junk yard to the west, and vacant land to the east, west, and south. The enclosure to be built will be consistent with the existing industrial buildings in the vicinity of the facility and will have to comply with the building height restrictions within the city of Rialto's Agua Mansa Specific Plan and the General Plan for the city of Rialto. Furthermore, the San Bernardino Mountains are to the north of the facility and there are no residences to the south of the facility whose scenic views could be blocked by the structures.

Comment 1-25

2-13 to 2-23	**Air Quality:** See Part 1, General Comments. The air quality analysis fails to consider the construction and operational emissions associated with the Gerdau meltshop/baghouse project.

Response to Comment 1-25

As described on Page 2-7 of the Draft EA, the commenter's meltshop/baghouse project was previously analyzed under CEQA by the City of Rancho Cucamonga as the lead agency (Project File No.: Environmental Assessment and Conditional Use Permit DRC2008-00512) and, as a CEQA responsible agency, the SCAQMD issued air permits to construct on July 24, 2014, which was prior to the PR 1420.2 rulemaking process. Since the construction of the meltshop/baghouse was previously analyzed under a separate CEQA document and the permits to construct have been issued, SCAQMD staff found the construction of the meltshop/baghouse to be reasonably certain with or without PR 1420.2; therefore, SCAQMD staff considered the meltshop/baghouse as part of the CEQA baseline and did not include the impacts associated with the construction of the meltshop/baghouse in the Draft EA. The Draft EA focused on the additional measures that the facility would have to implement in order to comply with PR 1420.2, which included the installation of a negative air pressure system and increased housekeeping.

Comment 1-26

2-14	**III. a):** The Draft EA concludes that there would be no adverse impact related to inconsistency with an air quality plan because the proposed rule is consistent with the plan. This reasoning improperly equates the Project and Project Objectives with the Project impacts. The Draft EA must discuss whether the emissions associated with the construction and operational actions needed to achieve compliance will conflict with an approved air quality plan.

Response to Comment 1-26

The Draft EA properly evaluated whether the project itself would conflict with or obstruct any applicable air quality plan as required in the checklist on page 2-13 of the Draft EA. In response to the comment, a discussion has been added regarding the project's impacts contained in Section III.b) and f) of the Draft EA (Page 2-15). Specifically, construction and operational emissions associated with PR 1420.2 will not exceed the SCAQMD's CEQA significance thresholds, therefore PR 1420.2 will not conflict with an approved air quality plan and this impact remains less than significant.

Comment 1-27

2-17	The text at the top of the page presents very limited actions required to comply with the requirements of the rule. This picture is not accurate with respect to construction of total enclosure of slag handling and storage. If the EA is premised on the assumption that no facility will need to construct enclosed conveyors and storage enclosures, this assumption should be disclosed and explained. In the same vein, there is no support for the assumption in footnote 4 that no grading would be required, particularly if Gerdau is required to construct enclosed slag conveyors and total enclosures for slag storage. The last paragraph states that staff assumed construction periods for the various facilities will not overlap. See Part 1, General Comments, with respect to the long construction schedule required to complete the Gerdau meltshop/baghouse.

Response to Comment 1-27

Page 2-6 of the Draft EA includes a section titled "Discussion and Evaluation of Environmental Impacts", which goes into detail the assumptions used in the CEQA analysis based on the actions facilities would need to take to ensure compliance with PR 1420.2. This information is repeated on Page 2-16 of the Draft EA and provides a complete view of the actions needed to comply with the rule. Further, as described on Page 2-7 of the Draft EA, the commenter's meltshop/baghouse project was previously analyzed under CEQA by the City of Rancho Cucamonga as the lead agency (Project File No.: Environmental Assessment and Conditional Use Permit DRC2008-00512) and, as a CEQA responsible agency, the SCAQMD issued air permits to construct on July 24, 2014, which was prior to the PR 1420.2 rulemaking process. Since the construction of the meltshop/baghouse was previously analyzed under a separate CEQA document and the permits to construct have been issued, SCAQMD staff found the construction of the meltshop/baghouse to be reasonably certain with or without PR 1420.2; therefore, SCAQMD staff considered the meltshop/baghouse as part of the CEQA baseline and did not include the impacts associated with the construction of the meltshop/baghouse in the Draft EA. The Draft EA focused on the additional measures that the facility would have to implement in order to comply with PR 1420.2, which included the installation of a negative air pressure system and increased housekeeping. Since Gerdau would only need to install a negative air pressure system, no grading would be required for that action and it was not analyzed in the Draft EA.

As discussed in Section III.c) on Page 2-21 of the Draft EA, "criteria pollutant project-specific air quality impacts from implementing PR 1420.2 would not exceed air quality significance thresholds (Error! Reference source not found.), cumulative impacts are not expected to be significant for air quality. SCAQMD cumulative significance thresholds are the same as project-specific significance thresholds. Therefore, potential adverse impacts from implementing the proposed rule would not be "cumulatively considerable" as defined by CEQA Guidelines §15064(h)(1) for air quality impacts. Per CEQA Guidelines §15064(h)(4), the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulative considerable." Therefore, it is not necessary to evaluate the overlapping emissions from the construction of Gerdau's meltshop/baghouse with the construction emissions for rule compliance.

Comment 1-28

2-19	**Operational Impacts:** The EA assumes that a round trip distance of 200 miles to transport hazardous waste. The EA does not contain sufficient information regarding the location of the regulated facilities or the waste disposal sites to substantiate this assumption.

Response to Comment 1-28

The Draft EA assumed a worst case average distance of affected facilities sending operational hazardous waste to the Allied Waste La Paz County Landfill in Arizona (which is based on a 200 mile round trip from the I-10 district border. Most of the facilities send their hazardous waste to a local smelter or to the US Ecology Inc. in Beatty, Nevada (which is about 126 miles round trip from the SCAQMD border).

Comment 1-29

2-21	**III. d) Toxic Air Contaminants:** See comments above regarding construction schedule assumptions. Twenty-one days is insufficient time to construct the Gerdau meltshop/baghouse. It also is insufficient time to construct enclosed conveyors for slag handling, total enclosures for slag storage, site paving the large Gerdau site, and other requirements of the rule. If the EA is premised on the assumption that compliance with these standards will not be required due to use of other compliance options or exemptions, the assumptions should be disclosed and explained.

Response to Comment 1-29

PR 1420.2 was modified to allow use of dust suppressants based on comments from Gerdau, and Gerdau will not need to construct enclosures as a result of PR 1420.2. In addition, PR 1420.2 also allows use of dust suppressants during transport of slag, as requested by Gerdau. It is the SCAQMD staff's understanding that Gerdau intends to comply with paragraphs (h)(5) and (h)(6) using dust suppressants based on meetings and correspondence with representatives of Gerdau and SCAQMD staff. Currently, Gerdau is applying dust suppressants to their slag piles; therefore, the environmental impacts associated with complying with this rule provision are included in the CEQA baseline. Furthermore, based on a review of operations at the other 12 affected facilities, none of the facilities would need to apply dust suppressants in order to comply with this provision in PR 1420.2. Therefore, there are no new environmental impacts associated with this rule provision which have not been evaluated in the Draft EA.

The SCAQMD's CEQA thresholds of significance are based on a maximum daily mass emission basis. By assuming a shorter construction duration, SCAQMD staff also assumed more equipment would be needed on a daily basis, which would provide a conservative analysis of the maximum daily emissions. It should be noted that Proposed Rule 1420.2 was modified to extend the time to install the total enclosure with negative air from July 2017 to April 2018 in response to comments from Gerdau.

Comment 1-30

2-22	**Greenhouse Gas Impacts:** See comments above. In the same manner that the EA underestimates construction and operational emission of criteria pollutants, so too it underestimates emissions of greenhouse gas emissions. In addition, as described in Part I, General Comments, closure of the Rancho Cucamonga facility would cause major disruptions and shifts in scrap metal hauling and recycling and the manufacture of seismic rebar for the California market. These shifts would result in a substantial increase in greenhouse gas emissions that must be evaluated in the EA, if the proposed rule retains any provisions that would result in the closure of the Rancho Cucamonga facility.

Response to Comment 1-30

The greenhouse gas emissions were estimated using the same assumptions used in the air quality analysis. As described in responses to comments above, since the air quality emissions were not underestimated, neither were the greenhouse gas emissions.

The rule has been revised since the release of the Draft EA based on SCAQMD's staff's work with the affected facilities, including Gerdau. It is the SCAQMD staff's understanding based on various conversations with representatives from Gerdau that revisions to Proposed Rule 1420.2 have addressed all the facilities' concerns and that the facility no longer believes closure is reasonably foreseeable. SCAQMD staff has made a number of revisions to Proposed Rule 1420.2 to address concerns raised by Gerdau such as, but not limited to, extending the compliance date for the total enclosure with negative air from July 2017 to April 2018, revising requirements for storing slag, reducing the inward face velocity for openings in total enclosures with negative air from 300 to 200 feet per minute, and allowing a 15 minute rolling average for demonstrating compliance with differential pressure monitoring for total enclosures with negative air. As proposed, PR 1420.2 does not impose requirements that would make facility closure reasonably foreseeable. Because the revised rule does not contain requirements that are technologically or economically infeasible and facility closure is not reasonably foreseeable, CEQA does not require the analysis of indirect environmental impacts associated with facility closure. Therefore, the direct and indirect impacts from facility closure do need to be analyzed in the Final EA.

Comment 1-31

2-23 to 2-25	**Biological Impacts:** The EA dismisses impacts to biological resources because the regulated facilities are within urban areas. This is not sufficient analysis under CEQA. The June 2015 version of the rule evaluated in the EA would require elimination of nearly all landscaped areas at the Gerdau plant. The same may be true of other regulated facilities. Within an urban environment, even non-native vegetation can be important in connecting habitats of sensitive species. Moreover, CEQA requires analysis of impacts to migratory birds regardless whether a specific species is listed as threatened or endangered.

Response to Comment 1-31

Although PR 1420.2 contains certain landscape limits, SCAQMD staff is unaware of any evidence suggesting that landscaped areas at the affected facilities play any role with respect to any species or habitats, including migratory birds and the commenter has not provided any evidence to the contrary. Most of the facilities are located within urban, industrialized areas and are either completely paved or do not contain landscaped areas which are important in connecting the habitats of sensitive species. At the request of US Battery Manufacturing Company, which has landscaped areas along the property boundary, PR 1420.2 has been updated to allow a greater area of landscaping square footage (from 100 ft^2 to 500 ft^2). Although this facility has the largest landscaped area of any of the affected facilities, this facility is located within an industrial area, surrounded by a railroad track to the south and other industrial concrete buildings. This facility does not provide habitat for sensitive species and there are no additional biological impacts which were not envisioned in the Draft EA.

Comment 1-32

2-24	**Biological Impacts:** The EA suggests that the proposed rule would have a beneficial impact "more closely in line with protecting biological resources" because it is designed to reduce lead emissions. Implicit in this claimed environmental benefit is the assumption that current levels of lead in the environment are harming biological resources. The EA must provide support for this assumption or delete the unsubstantiated claim of environmental benefit to biological resources.

Response to Comment 1-32

The purpose of Rule 1420.2 is "to reduce lead emissions from metal melting facilities by limiting the ambient lead concentration and requiring housekeeping and maintenance provisions to reduce the amount of lead emitted into the air from point and fugitive sources". Through atmospheric deposition, lead dust generated at facilities will necessarily deposit on the soil in the vicinity of the facility and will accumulate over time. Lead is an element which does not decompose and SCAQMD monitoring data has shown elevated levels of lead at source-oriented monitors placed at Trojan Battery and Gerdau, which substantiates the statement that lead accumulation on surfaces is expected in the vicinity of these lead sources.

Based on the elevated levels of lead detected by the ambient air monitors placed in the vicinity of Trojan Battery and Gerdau, and the atmospheric deposition of lead dust in the vicinity of affected facilities, it is reasonable to assume that by limiting the source of lead emissions, PR 1420.2 will reduce the amount of lead which is introduced into the environment surrounding the affected facilities.

Comment 1-33

2-26	**Cultural Resources Discussion, V. a):** The EA states that none of the facilities include any existing structures that would be considered historically significant, that have contributed to California history, or that pose high artistic values. The EA provides no substantiation for this conclusion in the form of cultural resources surveys or even site visits by trained historians or architects.

Response to Comment 1-33

SCAQMD staff is unaware of any evidence that the facilities include historically significant structures and the commenter has not provided any evidence or made any claims to the contrary. As stated on Page 2-26 of the Draft EA, "PR 1420.2 would require the placement of ambient air quality monitors, construction of total enclosures, and implementation of housekeeping and maintenance activity requirements, such as wet washing, vacuuming, and stabilizing dirt areas. Ambient air monitors may be placed off-site in the surrounding industrial area." None of the provisions in PR 1420.2 would affect existing structures and the commenter has not provided any evidence to the contrary. The enclosure to be constructed at Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) would be a new enclosure which would not affect ant of the existing structures on-site. Facilities which would require the use of different filter media for their point source controls would not result in changes to the existing structures or control equipment.

Comment 1-34

2-27 to 2-31	**Energy:** The Draft EA fails to quantify and evaluate the following energy (gas, electricity, gasoline and diesel) requirements of compliance with the proposed rule: construction and operation of enclosed slag conveyors; construction of enclosed slag storage; construction and operation of the Gerdau meltshop/baghouse, including three new 1,500 hp exhaust fans; 1-in-3 day air monitoring.

Response to Comment 1-34

As described on Page 2-7 of the Draft EA, the commenter's meltshop/baghouse project was previously analyzed under CEQA by the City of Rancho Cucamonga as the lead agency (Project File No.: Environmental Assessment and Conditional Use Permit DRC2008-00512) and, as a CEQA responsible agency, the SCAQMD issued air permits to construct on July 24, 2014, which was prior to the PR 1420.2 rulemaking process. Since the construction of the meltshop/baghouse was previously analyzed under a separate CEQA document and the permits to construct have been issued, SCAQMD staff found the construction of the meltshop/baghouse to be reasonably certain with or without PR 1420.2; therefore, SCAQMD staff considered the meltshop/baghouse as part of the CEQA baseline and did not include the impacts associated with the construction of the meltshop/baghouse in the Draft EA. The Draft EA analyzed the impacts from the additional measures that the facility would have to implement in order to comply with PR 1420.2, which included the installation of a negative air pressure system and increased housekeeping. The energy impacts from the construction of the two enclosures at Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) and Liberty Manufacturing were included in Table 2-7 of the Draft EA.

This comment is referring to provision (h)(5) of PR 1420.2, which does not require the construction of a total enclosure for storage of slag, but allows facilities to choose other options such as using sealed, leak-proof containers or stabilization using dust suppressants. Proposed Rule 1420.2 was modified to allow use of dust suppressants based on comments from Gerdau. In addition, Proposed Rule 1420.2 also allows use of dust suppressants during transport of slag, as requested by Gerdau. It is the SCAQMD staff's understanding that Gerdau intends to comply with paragraphs (h)(5) and (h)(6) using dust suppressants based on meetings and correspondence with representatives of Gerdau and SCAQMD staff. Currently, Gerdau is applying dust suppressants to their slag piles; therefore, the environmental impacts associated with complying with this rule provision are included in the CEQA baseline. Furthermore, based on a review of operations at the other 12 affected facilities, none of the facilities would need to apply dust suppressants in order to comply with this provision in PR 1420.2. Therefore, there are no new environmental impacts associated with this rule provision which have not been evaluated in the Draft EA.

The energy impacts associated with the monitoring requirements of PR 1420.2 were included in Table 2-9 on Page 2-30.

Comment 1-35

2-33	**Geology and Soils, VII. b):** The EA fails to evaluate any impacts on soil erosion or loss of topsoil associated with removing landscaping, grading and paving the site. If it is assumed that no facility will be required to take these actions due to other compliance options or exemptions, the EA should clearly state the assumptions and the underlying support for the assumptions.

Response to Comment 1-35
As stated on page 2-6 of the Draft EA, SCAQMD staff analyzed impacts on soil erosion and loss of topsoil from paving at two facilities. At the request of US Battery Manufacturing Company, which has landscaped areas along the property boundary, PR 1420.2 has been updated to allow a greater area of landscaping square footage (from 100 ft^2 to 500 ft^2). Once these facilities are paved, the potential of substantial soil erosion and the loss of topsoil would be minimized. Additionally, the Gerdau Plant contains large unpaved areas and no geological hazards are reasonably foreseen from paving their property.

Comment 1-36

2-41	**Land Use and Planning, X. b):** The Draft EA summarily dismisses this topic because the regulated facilities are located in urbanized, industrial or commercial areas. This is inadequate under CEQA. Rule requirements implicating the zoning, planning and other land use controls of local governments include the construction of tall walls or buildings, installation of enclosed conveyors, removal of landscaping, to illustrate just a few. The EA must be revised to include a meaningful discussion of potential land use impacts.

Response to Comment 1-36
Regarding potential land use and zoning impacts, the Draft EA already considers the potential impact from minor facility modifications that could impact land use due to the rule (these modifications do not include the meltshop/baghouse project at Gerdau as this project has previously been approved and is part of the CEQA baseline). In particular, the Draft EA already stated on page 2-41 that the potential facility modifications will not divide an established community because any facility modifications will occur onsite or will be so minor that they will not affect any land use plans, policies, or regulations, including any zoning or building height provisions. For example, the likely construction of an enclosure at Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) would be consistent with the land use policies, regulations, building height requirements, and zoning of the Agua Mansa Specific Plan and General Plan for the city of Rialto.

As described on Page 2-7 of the Draft EA, the commenter's meltshop/baghouse project was previously analyzed under CEQA by the City of Rancho Cucamonga as the lead agency (Project File No.: Environmental Assessment and Conditional Use Permit DRC2008-00512) and, as a CEQA responsible agency, the SCAQMD issued air permits to construct on July 24, 2014, which was prior to the PR 1420.2 rulemaking process. Since the construction of the meltshop/baghouse was previously analyzed under a separate CEQA document and the permits to construct have been issued, SCAQMD staff found the construction of the meltshop/baghouse to be reasonably certain with or without PR 1420.2; therefore, SCAQMD staff considered the meltshop/baghouse as part of the CEQA baseline and did not include the impacts associated with the construction of the meltshop/baghouse in the Draft EA. The Draft EA analyzed the impacts from the additional measures that the facility would have to implement in order to comply with PR 1420.2, which included the installation of a negative air pressure system and increased housekeeping.

The Draft EA conservatively assumed that two facilities (Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) and Liberty Manufacturing (referred to as Facility L in Table B-10 in Appendix B of the Draft EA)) would construct total enclosures. With the current revisions to PR 1420.2, only one facility (Atlas Pacific Corp) would need to construct a total enclosure to comply with PR 1420.2. Atlas Pacific Corp is located in an industrial area in the city of Rialto and is surrounded by a tilt-up concrete warehouse building to the north, a junk yard to the west, and vacant land to the east, west, and south. The enclosure to be built will be consistent with the existing industrial buildings in the vicinity of the facility and will have to comply with the building code requirements within the city of Rialto's Agua Mansa Specific Plan and the General Plan for the city of Rialto.

As previously discussed, Proposed Rule 1420.2 allows use of dust suppressants for storage and transport of slag. The owner or operator of a lead melting facility has a variety of choices to comply with the storage and transport of slag. Based on meetings with affected facilities, the only facility that has commented on the concern for constructing a structure storing or transporting for slag has been Gerdau. This was an issue that Gerdau provided written comments and also discussed in Working Group meetings. As a result, Proposed Rule 1420.2 was modified to allow in addition to storing slag in sealed, leak-proof containers, and transport of slag within closed conveyor systems or in sealed, leak-proof containers to allow use of dust suppressants for both the storage and transport of slag. Provision (h)(3)(c) of the September 2, 2015 version of PR 1420.2, which addresses the paving of landscape areas, does not conflict with city permits, ordinance, or requirements for the State Water Control Board where paving would be required.

Comment 1-37

2-43	**Noise, XII. a), b), and c):** The Draft EA omits discussion of the potential noise impacts associated with the construction and operation of enclosed slag conveyors. If it is assumed that no facility will be required to construct and operate enclosed slag conveyors due to other compliance options or exemptions, the EA should clearly state the assumptions and the underlying support for the assumptions.

Response to Comment 1-37

The Draft EA conservatively assumed that two facilities (Atlas Pacific Corp (referred to as Facility H in Table B-10 in Appendix B of the Draft EA) and Liberty Manufacturing (referred to as Facility L in Table B-10 in Appendix B of the Draft EA)) would construct total enclosures. With the current revisions to PR 1420.2, only one facility (Atlas Pacific Corp) would need to construct a total enclosure to comply with PR 1420.2. Atlas Pacific Corp is located in an industrial area in the city of Rialto in San Bernardino County and is surrounded by a tilt-up concrete warehouse building to the north, a junk yard to the west, and vacant land to the east, west, and south. By building an enclosure over existing processes occurring at the Atlas Pacific Corp facility, the existing noise impacts would be reduced at that facility. As previously discussed, Proposed Rule 1420.2 allows use of dust suppressants for storage and transport of slag. The owner or operator of a lead melting facility has a variety of choices to comply with the storage and transport of slag. Based on meetings with affected facilities, the only facility that has commented on the concern for constructing a structure storing or transporting for slag has been Gerdau. This was an issue that Gerdau provided written comments and also discussed in Working Group meetings. As a result, Proposed Rule 1420.2 was modified to allow in addition to storing slag in sealed, leak-proof containers, and transport of slag within closed conveyor systems or in sealed, leak-proof containers to allow use of dust suppressants for both the storage and transport of slag. Currently, Gerdau is applying dust suppressants to their slag piles; therefore, the environmental impacts associated with complying with this rule provision are included in the CEQA baseline. Furthermore, based on a review of operations at the other 12 affected facilities, none of the facilities would need to apply dust suppressants in order to comply with this provision in PR 1420.2. Therefore, there are no new environmental impacts associated with this rule provision which have not been evaluated in the Draft EA.

Comment 1-38

2-43	**Noise, XII. d):** The Draft EA states that it is not known whether existing facilities are located within an airport land use plan or within 2 miles of a public airport. Only 13 facilities are regulated by the rule. This information is readily available and should be disclosed in the Draft EA.

Response to Comment 1-38

On Page 2-35 of the Draft EA, the analysis states that "Two of the facilities are located within two miles of a public airport." Senior Aerospace is located approximately 0.6 miles east of the Burbank Airport but is not located within the airport influence area. Teledyne Battery Products is located approximately 1.7 miles southeast of the San Bernardino International Airport but is not within the airport safety review area. This information has been updated on Page 2-43 of the Final EA.

Comment 1-39

2-47 to 2-49	**Solid and Hazardous Waste:** The Draft EA states that no demolition is expected as a result of the proposed rule. See comments above regarding the EA's failure to evaluate Gerdau's substantial meltshop/baghouse construction, which will include generation of demolition waste. In addition, cities and counties are required by state law to reduce the amount of waste, including construction waste, going to landfills. In the event that onerous or infeasible requirements are restored or added to the rule, causing closure of the Rancho Cucamonga facility, then either cities and counties will struggle to meet their diversion requirements under state law, or the scrap metal currently processed at the Rancho Cucamonga facility will need to be transported to out of state or out of country facilities, causing environmental impacts described elsewhere in these comments.

Response to Comment 1-39

As described on Page 2-7 of the Draft EA, the commenter's meltshop/baghouse project was previously analyzed under CEQA by the City of Rancho Cucamonga as the lead agency (Project File No.: Environmental Assessment and Conditional Use Permit DRC2008-00512) and, as a CEQA responsible agency, the SCAQMD issued air permits to construct on July 24, 2014, which was prior to the PR 1420.2 rulemaking process. Since the construction of the meltshop/baghouse was previously analyzed under a separate CEQA document and the permits to construct have been issued, SCAQMD staff found the construction of the meltshop/baghouse to be reasonably certain with or without PR 1420.2; therefore, SCAQMD staff considered the meltshop/baghouse as part of the CEQA baseline and did not include the impacts associated with the construction of the meltshop/baghouse in the Draft EA. The Draft EA focused on the additional measures that the facility would have to implement in order to comply with PR 1420.2, which included the installation of a negative air pressure system and increased housekeeping.

The rule has been revised since the release of the Draft EA based on SCAQMD's staff's work with the affected facilities, including Gerdau. It is the SCAQMD staff's understanding based on various conversations with representatives from Gerdau that revisions to Proposed Rule 1420.2 have addressed all the facilities' concerns and that the facility no longer believes closure is reasonably foreseeable. SCAQMD staff has made a number of revisions to Proposed Rule 1420.2 to address concerns raised by Gerdau such as, but not limited to, extending the compliance date for the total enclosure with negative air from July 2017 to April 2018, revising requirements for storing slag, reducing the inward face velocity for openings in total enclosures with negative air from 300 to 200 feet per minute, and allowing a 15 minute rolling average for demonstrating compliance with differential pressure monitoring for total enclosures with negative air. As proposed, PR 1420.2 does not impose requirements that would make facility closure reasonably foreseeable. Because the revised rule does not contain requirements that are technologically or economically infeasible and facility closure is not reasonably foreseeable, CEQA does not require the analysis of indirect environmental impacts associated with facility closure. Therefore, the waste impacts from facility closure do need to be analyzed in the Final EA.

Comment 1-40

2-49 to 2-51	**Transportation and Traffic:** See Part I, General Comments. In the event that onerous or infeasible requirements are restored or added to the rule, causing closure of the Rancho Cucamonga facility, then the scrap metal currently processed at the Rancho Cucamonga facility will need to be transported to out of state or out of country facilities, causing environmental impacts described elsewhere in these comments.

Response to Comment 1-40

The rule has been revised since the release of the Draft EA based on SCAQMD's staff's work with the affected facilities, including Gerdau. It is the SCAQMD staff's understanding based on various conversations with representatives from Gerdau that revisions to Proposed Rule 1420.2 have addressed all the facilities' concerns and that the facility no longer believes closure is reasonably foreseeable. SCAQMD staff has made a number of revisions to Proposed Rule 1420.2 to address concerns raised by Gerdau such as, but not limited to, extending the compliance date for the total enclosure with negative air from July 2017 to April 2018, revising requirements for storing slag, reducing the inward face velocity for openings in total enclosures with negative air from 300 to 200 feet per minute, and allowing a 15 minute rolling average for demonstrating compliance with differential pressure monitoring for total enclosures with negative air. As proposed, PR 1420.2 does not impose requirements that would make facility closure reasonably foreseeable. Because the revised rule does not contain requirements that are technologically or economically infeasible and facility closure is not reasonably foreseeable, CEQA does not require the analysis of indirect environmental impacts associated with facility closure. Therefore, the transport of scrap material outside of the SCAQMD boundaries do need to be analyzed in the Final EA.