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REVISED INITIAL STATEMENT OF REASONS

PROPOSED AMENDMENTS TO
CALIFORNIA CODE OF REGULATIONS
TITLE 8: Section 1532.1 of the Construction Safety Orders;
Section 5155 of the General Industry Safety Orders; and
Section 5198 of the General Industry Safety Orders

Lead

SUMMARY

Labor Code (LC) section 144.6 requires that the Occupational Safety and Health Standards Board (Board), when dealing with standards for toxic materials and harmful physical agents, adopt standards which most adequately assure, to the extent feasible, that no employee suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard for the period of their working lifetime. This section also requires that the Board base standards on research, demonstration, experiments and other information as may be appropriate. LC section 144.6 also lists other considerations such as the latest scientific literature, the reasonableness of the standards and experience gained under this and other health and safety laws.

The Board proposes to adopt amendments to title 8, California Code of Regulations (CCR), section 1532.1 of the Construction Safety Orders (CSO) and sections 5155 and 5198 of the General Industry Safety Orders (GISO). These proposed amendments are authorized by LC section 142.3. The proposed amendments are needed to adequately protect the health of employees who have occupational exposure to lead. Existing requirements in sections 1532.1, 5155 and 5198 are based on lead toxicity information and medical and epidemiological data that is now more than 40 years old. More recent evidence demonstrates that even very low levels of lead exposure can have harmful health effects. Such adverse health effects include high blood pressure, heart disease, decreased kidney function, lower birth weight, reproductive and neurological effects. These harmful effects can occur at levels well below those currently allowed by the regulations. The proposed amendments to the regulations are designed to mitigate more recently recognized adverse health effects from lower levels of exposure to lead.

Employees who work with lead can be exposed to it by both inhalation and oral routes of exposure. Employee blood lead levels (BLLs) reflect the employee's overall body burden of lead, which can be the combined result of exposure through both inhalation of airborne lead and oral ingestion of lead (e.g. from contaminated hands or other items put in the mouth). The BLL thus

is a better indicator of employee exposure to lead from both inhalation and oral routes of exposure than are measurements of the ambient airborne concentration of lead.

The Board's proposed changes are based in part on recommendations from the California Department of Public Health (CDPH, 2010) to the Division of Occupational Safety and Health (Division or Cal/OSHA). The CDPH Occupational Lead Poisoning Prevention Program (OLPPP) reviewed the scientific information, including a review from the National Toxicology Program (NTP, 2012) and a report issued by the US Environmental Protection Agency (EPA, 2013), and concluded that there is convincing evidence that chronic, low-level exposure to lead can cause harmful health effects. CDPH concluded that the BLL of employees should not exceed 5-10 micrograms per deciliter (µg/dl) over a working lifetime. This is consistent with goals set at the federal level by the Office of Disease Prevention and Health Promotion (ODPHP). In its Healthy People 2020 initiative (ODPHP, 2022), ODPHP set a goal of reducing the proportion of adults who have elevated BLLs (defined as 10 µg/dl or greater), stating that the vast majority of elevated BLLs are work-related. Further, a number of scientific agencies and organizations, including the National Institute for Occupational Safety and Health (NIOSH, 2018), the Council of State and Territorial Epidemiologists (2015) and the Centers for Disease Control and Prevention (CDC) National Notifiable Disease Reporting System (CDC, 2016) has designated 5 µg/dl as the case definition of an elevated BLL for adults.

This proposal is designed to maintain employee BLLs below 10 µg/dl, whereas existing regulations were designed to maintain employee BLLs below 40 µg/dl, a level four times higher. To achieve this goal, the proposed amendments would (1) reduce exposure to airborne lead; (2) reduce exposure to lead through the oral route of exposure; and (3) expand requirements for blood lead testing of employees who work with lead, independent of measured levels of airborne lead.

Existing title 8 regulations establish a permissible exposure limit (PEL) for lead of 50 micrograms of lead per cubic meter of air (µg/m^3), as an 8-hour time-weighted average (TWA) concentration. CDPH submitted health-based recommendations to Cal/OSHA for revising its Construction and General Industry lead standards (CDPH, 2013). The recommendations were based on a physiology-based pharmacokinetic (PBPK) model developed by the Office of Environmental Health Hazard Assessment in CalEPA (OEHHA, 2013). This model correlates exposure levels to airborne lead with resulting BLLs. In its recommendations, CDPH stated that in order to prevent chronic BLLs at or above 5-10 µg/dl, air lead levels in the workplace must not exceed an 8-hour TWA concentration of 0.5-2.1 µg/m^3. At a PEL of 2.1 µg/m^3, 95% of employees would have a BLL less than 10 µg/dl over their working lifetime. Cal/OSHA concluded that lowering the PEL to this low level was not a feasible regulatory option. However, a PEL of 10 µg/m^3, along with the suite of additional revisions, would have the same effect of reducing blood lead levels to 10 µg/dl for nearly all employees with occupational exposure to lead.

From February 23, 2011, through November 10, 2015, Cal/OSHA held six advisory committee meetings to determine what amendments should be proposed for sections 1532.1, 5198 and 5155. The meetings were open to the public. Representatives from industry, labor, occupational medicine, advocacy groups and government agencies participated. These meetings, held outside of the formal rulemaking process, provided opportunity for stakeholder comments and for solicitation of alternatives to the proposed regulation. At the advisory committee meetings, Cal/OSHA presented multiple discussion drafts and received input from stakeholders. In addition, a symposium, co-sponsored by CDPH and UC Berkeley, was held on November 13, 2013, to present the science behind CDPH's recommended revisions to the lead standards. Attendees included representatives from industry, labor, occupational medicine, advocacy groups and government agencies.

In June 2019, the state legislature passed and the governor signed Senate Bill (SB) 83, which, among other things, amended the Labor Code by creating new section 6717.5, which took effect on June 27, 2019. LC section 6717.5 requires Cal/OSHA to submit to the Board a rulemaking proposal to revise the lead standards of the GISO and the CSO, consistent with scientific research and findings.

SPECIFIC PURPOSE AND FACTUAL BASIS OF PROPOSED ACTION

The overall intent of the proposed amendments is to improve worker safety at places of employment in California by reducing the incidence of disease and other adverse health effects to workers caused by exposure to lead.

The proposed amendments and this rulemaking:

- Are based on the following authority and reference: LC section 142.3, which requires California to adopt occupational safety and health regulations that are equivalent to or more protective of worker health and safety than federal occupational safety and health regulations, and designates the Board as "the only agency in the state authorized to adopt occupational safety and health standards" (LC section 142.3(a)(1)).

- Differ from existing federal regulations, in that the PEL and action level proposed for lead are lower than those found in the Federal Occupational Safety and Health Administration (OSHA) lead standards at 29 CFR 1926.62, 1910.1025 and 1910.1000, and other requirements more stringent than those in 29 CFR 1926.62, 1910.1025 and 1910.1000 are proposed. The Board believes Cal/OSHA appropriately carried out its mandate under LC section 147.1 to present to the Board the amendments proposed in this rulemaking, including a determination of necessity for the proposed amendments. In addition, the Board believes that with this proposal, it is carrying out its mandate under LC section 144.6 to adopt standards dealing with toxic materials which most adequately assure, to the extent feasible, that no employee will suffer material

impairment of health or functional capacity, taking into account the latest available scientific data in the field and the reasonableness of the standard.

- Are not inconsistent or incompatible with existing state regulations. This proposal is part of a system of occupational safety and health regulations. The consistency and compatibility of that system's component regulations is provided by such things as the requirement of the federal government and the Labor Code to the effect that the State regulations be at least as effective as their federal counterparts, and the requirements that all state occupational safety and health rulemaking be channeled through a single entity (the Board).

- Will enhance employee safety by reducing employee exposures to lead in the workplace.

The specific purpose and factual basis of the proposed amendments are outlined below:

Section 1532.1 Lead.

Subsection (b) Definitions.

Subsection (b) defines terms used throughout the regulation.

These proposals would modify the definition of **action level**, by lowering the action level from 30 µg/m^3 to 2 µg/m^3.

As the action level is used in the regulation to trigger certain employee protections, this reduction in the action level is necessary to provide greater protection to employees who work in areas with airborne lead concentrations of 2 µg/m^3 or greater as an 8-hour TWA. This is in service of the overall goal of maintaining employee BLLs below 10 µg/dl.

These proposals would modify the definition of **supervisor**, by changing the reference to section (*l*)(3) to subsection (*l*)(3).

This change is necessary to correctly identify subsection (*l*)(3).

The following new definitions are proposed for section 1532.1. They are necessary to establish the exact meanings for the terms as used within the context of the requirements of section 1532.1. They are necessary to clarify that the terms, as used, may have more specific meanings for the protection of workers from occupational exposure to lead than they would in general usage.

Altering or disturbing is defined to identify activities that may result in the release of lead dust, lead mist, lead fume, or other lead particles. The definition provides employers with specific examples of activities that are "altering or disturbing."

This definition is necessary to establish the type of activities that are referred to in subsection (k) Medical removal protection.

Blood lead level is defined to mean and identify the concentration of lead measured in whole blood, expressed as micrograms per deciliter (µg/dl) of whole blood.

This definition is necessary to ensure that employers provide appropriate testing of the blood of employees when required by the regulation.

High-efficiency particulate air (HEPA) filter is defined to clarify the meaning of the acronym HEPA, and to state the physical properties of a HEPA filter.

This definition is necessary as the acronym HEPA is used in the existing language of the regulation in several subsections but is not defined.

Level 1 trigger task is defined to mean a task listed in subsection (d)(2)(A), which, until an exposure assessment as required in subsection (d) is completed, is presumed to result in employee exposure above the PEL, but not greater than 10 times the PEL.

Level 2 trigger task is defined to mean a task listed in subsection (d)(2)(C), which, until an exposure assessment as required in subsection (d) is completed, is presumed to result in employee exposure above 10 times the PEL, but not greater than 50 times the PEL.

Level 3 trigger task is defined to mean a task listed in subsection (d)(2)(D), which, until an exposure assessment as required in subsection (d) is completed, is presumed to result in employee exposure above 50 times the PEL.

Trigger task - **not listed** is defined to mean a task described in subsection (d)(2)(B), which, until an exposure assessment as required in subsection (d) is completed, is presumed to result in employee exposure above the PEL.

Employers and employees frequently use the term "trigger tasks" to refer informally to the tasks listed in subsection (d)(2). The addition of definitions for level 1, 2 and 3 trigger tasks, and trigger task - not listed, is necessary to simplify the language used throughout the regulation, in the vernacular spoken on jobsites by employers and employees, where references are made to these tasks.

Subsection (c) Permissible exposure limit (PEL).

Subsection (c) establishes the PEL for lead, the maximum airborne concentration of lead, calculated as an 8-hour TWA, to which employees may be exposed during a work day. When respirators are used to supplement engineering and work practice controls to comply with the PEL, employee exposure, for the purpose of determining whether the employer has complied with the PEL, may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily 8-hour TWA exposure.

This proposal would add the acronym PEL to the title of subsection (c).

This addition is necessary, as the acronym PEL is used in existing language in the regulation, but is not defined.

Subsection (c)(1) establishes the PEL for lead. These proposals would lower the PEL for lead from 50 µg/m^3 to 10 µg/m^3.

This change is necessary to ensure that employees are protected from airborne exposures to lead that could cause disease or other adverse health effects. The lower PEL is in service of the goal of maintaining employee BLLs below 10 µg/dl.

These proposals would modify the language in subsection (c)(1) to state that the PEL refers to "an airborne concentration" of lead.

This change is necessary to provide greater clarity as well as consistency with the language used in recently adopted title 8 regulations, such as section 1535.1 (Beryllium).

These proposals would replace the phrase "averaged over an 8-hour period" with "calculated as an 8-hour time-weighted average (TWA)." In addition, the following sentence would be added in subsection (c)(1): "The 8-hour TWA shall be calculated in accordance with the appendix to section 5155."

These changes are necessary to provide consistency with the language used in section 5155 (Airborne Contaminants) as well as all other Cal/OSHA substance-specific standards.

These proposals would replace the word "assure" with the word "ensure" here, and throughout the regulation.

This change is proposed as the word "ensure" means to make certain or to confirm, while the word "assure" means to promise. The standard requires the employer to make certain that requirements are met.

These proposals would add an exception to subsection (c)(1). The exception would allow, until 5 years from the effective date, employers to expose employees conducting abrasive blasting to an airborne concentration of lead no greater than 25 $\mu g/m^3$ as an 8-hour TWA.

This exception is necessary as a PEL of 10 $\mu g/m^3$ would necessitate a change in work practices currently used on infrastructure projects, which may affect project bids. There is a need to avoid disruption of the bidding 'pipeline', as the industry transitions to the new PEL and the initial cost uncertainties involved. There is sometimes a 3 to 5 year lag on infrastructure project contracts between bid deadlines to Caltrans and the commencement of work (California Department of Transportation – Caltrans, 2016). These bids have already been submitted based on the current PEL and the known costs associated with current work practices. Therefore, an interim 5-year period, with a proposed PEL of 25 $\mu g/m^3$, is needed for abrasive blasting work. Industry compliance with this interim PEL of 25 $\mu g/m^3$ can be attained without significant changes in work practices (The Society for Protective Coatings – SSPC, 2016).

Existing **subsection (c)(2)** provides a formula to calculate an allowable exposure level when an employee is exposed to lead for more than 8 hours in any work day. These proposals would remove this formula, along with accompanying language, from this subsection.

This change is without regulatory effect and is necessary because calculating the allowable exposure in this way is confusing and departs from the way exposures greater than 8 hours are regulated by Cal/OSHA in all other substance specific regulations, as well as in section 5155 (Airborne Contaminants) and its appendix.

The language in existing subsection (c)(3) would be redesignated as subsection (c)(2).

Subsection (d) Exposure assessment.

Subsection (d)
This subsection establishes requirements for the determination and monitoring of employee exposure levels to airborne lead.

Subsection (d)(2)
This subsection establishes requirements for the protection of employees before an employer performs an employee exposure assessment as required by subsection (d).

These proposals would change the heading of this subsection from "Protection of employees during assessment of exposure" to "Protection of employees prior to assessment of exposure."

This change is necessary to clarify that the specified protections are required until the time that an employer has assessed the exposure of an employee, rather than having merely initiated an exposure assessment.

Subsection (d)(2)(A) – (C)
These proposals would also replace the phrase "employee protective measures" with the phrase "interim protection."

This change is necessary so that consistent language is used throughout the standard. Each of these subsections refers to "employee protective measures as prescribed in subsection (d)(2)(E)." Subsection (d)(2)(E) refers to these measures as "interim protection."

Subsection (d)(2)(A)
These proposals would add a heading of "Level 1 trigger tasks." Also in subsection (d)(2)(A), these proposals would remove the words "lead-related tasks" and replace them with "level 1 trigger tasks."

These changes are necessary to more clearly identify, in the vernacular used on jobsites, which tasks are covered by subsection (d)(2)(A).

Some tasks, which are listed in existing subsection (d)(2)(A)1., would be removed from the list of tasks covered by subsection (d)(2)(A), specifically manual sanding, and power tool cleaning with dust collection systems. The remaining tasks would be absorbed into the body of paragraph (d)(2)(A). Subsection (d)(2)(A)1. would be removed. In addition, subsection (d)(2)(A)2., which lists spray painting with lead paint as a task covered by subsection (d)(2)(A), would be removed.

The removal of these tasks is necessary because the proposed PEL is lower than the existing PEL, and these tasks would no longer meet the condition that an employee performing them has a presumed exposure not in excess of 10 times the PEL.

Subsection (d)(2)(B)
These proposals would add a heading of "Trigger tasks - not listed."

This addition is necessary to provide consistency in the naming of tasks included in subsection (d)(2).

Subsection (d)(2)(C)
These proposals would add a heading of "Level 2 trigger tasks," as well as add a reference to level 2 trigger tasks.

These additions are necessary to more clearly identify, in the vernacular used on jobsites, which tasks are covered by subsection (d)(2)(C).

In addition, references to 500 µg/m^3 would be changed to 100 µg/m^3.

This change is necessary to reflect the proposed PEL.

In addition, following the first appearance of the proposed exposure level of 100 µg/m^3, the term "10 x PEL" would be added.

This addition is necessary for consistency with the format used in subsection (d)(2)(D).

Also, a reference in subsection (d)(2)(C) to "Table 1 of this section" would be changed to "section 5144(d)(3)(A)1."

This change is necessary as there is no Table 1 in the current standard, while section 5144(d)(3)(A)1. includes a relevant table that lists assigned protection factors for various types of respirators.

In addition, some tasks listed in subsection (d)(2)(C) would be removed from this subsection (using lead containing mortar; lead burning; and where lead containing coatings or paint are present: rivet busting; power tool cleaning without dust collection systems; cleanup activities where dry expendable abrasives are used; and abrasive blasting enclosure movement and removal).

These changes are necessary to reflect the proposed PEL, as these tasks would no longer meet the condition that performing them is presumed to result in employee exposure above 10 times the PEL.

Also, some additional tasks would be added to this subsection (manual sanding; power tool cleaning, grinding, or sanding with dust collection systems; and spray painting with lead paint).

This change is necessary, since under the proposed PEL, these tasks would meet the condition that performing them is presumed to result in employee exposure above 10 times the PEL.

Subsection (d)(2)(D)
These proposals would add a heading of "Level 3 trigger tasks," as well as add a reference to level 3 trigger tasks.

These additions are necessary to more clearly identify, in the vernacular used on jobsites, which tasks are covered by subsection (d)(2)(D).

In addition, references to 2,500 µg/m^3 would be changed to 500 µg/m^3.

These changes are necessary to reflect the proposed PEL.

Also, a reference in subsection (d)(2)(D) to "Table 1 of this section" would be changed to "section 5144(d)(3)(A)1."

This change is necessary as there is no Table 1 in the current standard, while section 5144(d)(3)(A)1. includes a table that lists assigned protection factors for various types of respirators.

Also in subsection (d)(2)(D), a minor word change would be made. The phrase "as described in this subsection..." would be changed to "as prescribed in subsection (d)(2)(E)...."

This change is necessary for consistency with the language used in subsections (d)(2)(A), (d)(2)(B) and (d)(2)(C).

In addition, the words "on structures" would be removed from this paragraph.

This change is necessary for consistency with subsection (d)(2)(C), which does not restrict the subject coatings or paints to those on structures.

The order in which tasks are listed in subsection (d)(2)(D) would be changed, and subsection (d)(2)(D) would be expanded to allow for the inclusion of additional level 3 trigger tasks (using lead containing mortar and lead burning would be listed in subsection (d)(2)(D)1., and where lead-containing coatings or paint are present, rivet busting; power tool cleaning, grinding or sanding without dust collection systems; cleanup activities where dry expendable abrasives are used; and abrasive blasting enclosure movement and removal would be listed in subsection (d)(2)(D)2. a. – d.). In addition, abrasive blasting, welding, torch cutting and torch burning would be listed in subsections (d)(2)(D)2.e. – h.

These changes are necessary because, under the proposed PEL, these tasks would meet the condition that performing them is presumed to result in employee exposure above 50 times the PEL. The changes would correctly list the tasks in subsection (d)(2)(D).

The word "torch" would be inserted before the word "cutting."

This amendment is necessary to clarify that the task being referred to is torch cutting.

Subsection (d)(2)(E)
These proposals would modify subsection (d)(2)(E), which establishes requirements for interim protections for employees performing tasks described in subsections (d)(2)(A), (B), (C) and (D).

Subsection (d)(2)(E)4.
A requirement for the provision of handwashing facilities would be removed.

This change is necessary as handwashing would be a basic protection for all exposed employees under the proposed changes in subsection (i)(1), so it no longer would be listed in subsection (d)(2)(E). In subsection (d)(2)(E)4., a requirement would be added to provide shower facilities, as required by proposed subsection (i)(3), as an interim protection for employees performing level 3 trigger tasks.

Subsections (d)(2)(E)5. and 6.
These subsection would be redesignated as subsections (d)(2)(E)8. and 9.

Subsection (d)(2)(E)5.
A requirement would be added to provide eating facilities or areas, as required by proposed subsection (i)(4), as an interim protection for employees performing trigger tasks.

These changes are necessary to provide greater protection to employees who perform level 3 trigger tasks by enabling them to remove lead contamination from their skin, and have a place to eat that is free of lead contamination, thus reducing the potential for exposure due to ingestion.

Subsection (d)(2)(E)6.
A requirement would be added to provide regulated areas, as required by subsection (i)(6), as an interim protection for employees performing trigger tasks. Regulated areas are work areas where employees are exposed to lead at or above the PEL without regard to the use of respirators where specific postings and protections are required.

This addition is necessary as a regulated area is required by an existing requirement in subsection (i)(6), and may have inadvertently been left out when the standard was initially promulgated.

Subsection (d)(2)(E)7.
A requirement regarding dry abrasive blasting would be added. As an interim administrative control for employees conducting dry abrasive blasting, the amount of time an employee could conduct dry abrasive blasting would be limited to 5 hours per day, except that after 5 years from the effective date of the standard, the amount of time would be limited to 2 hours per day. As an interim protection, this administrative control would apply only until exposure assessment has been conducted, after which exposure controls would be determined by the results of the exposure assessment.

This addition is necessary to provide adequate interim protection for employees conducting dry abrasive blasting, from exposure to potentially high airborne levels of lead. When Federal OSHA promulgated their Lead in Construction standard, they used a presumed exposure level of 37,000 µg/m^3 for abrasive blasting. Since the most protective respirator, other than a self-contained breathing apparatus (SCBA), is a supplied air respirator with an assigned protection factor of 1,000, employees wearing a supplied air respirator could be protected up to an airborne concentration of 10,000 µg/m^3 without exceeding the proposed PEL of 10 µg/m^3. In order to keep presumed levels of exposure from dry abrasive blasting below the proposed PEL, blasting by a given employee would have to be limited to 2 hours per shift, which would result in a presumed exposure of 37,000 µg/m^3 multiplied by 1/4 = 9,250 µg/m^3, which is less than 10,000 µg/m^3. As there is an exception for abrasive blasting to the proposed PEL for the first 5 years from the effective date of the standard, which would limit exposure to employees conducting abrasive blasting to 25 µg/m^3 as an 8-hour TWA, blasting during this 5 year period would have to be limited to 5 hours per shift, which would result in a presumed exposure of 37,000 µg/m^3 × 5/8 = 23,125 µg/m^3 as an 8-hour TWA, which is less than 25,000 µg/m^3 as an 8-hour TWA.

Subsection (d)(2)(E)8.
These proposals would redesignate subsection (d)(2)(E)5. to subsection (d)(2)(E)8., and modify the language in this subsection. The term "biological monitoring" would be replaced by "medical surveillance." Biological monitoring refers to blood tests, while medical surveillance is a more inclusive term, and includes medical examinations and consultations. In addition, a reference to subsection (j)(1)(B) would be added.

These changes are necessary to provide greater protection to employees who perform trigger tasks by requiring, as interim protection, that they be provided with medical examinations and consultations, in addition to blood lead tests.

In subsection (d)(2)(E)8., a reference to blood sampling and analysis for lead and zinc protoporphyrin (ZPP) levels would be removed.

This change is necessary as ZPP would no longer be a required test for employees whose BLL is below 20 µg/dl. ZPP testing is no longer required because Kosnett et al. (2007) reported that routine measurement of ZPP is not recommended because it is an insensitive biomarker of lead exposures in individuals with blood lead concentrations below 25 µg/dl. Therefore, ZPP testing would only be required as part of a medical examination, pursuant to subsection (j)(3), for employees with blood lead levels at or above 20 µg/dl. Thus, subsection (j)(2) would establish requirements related only to blood lead testing and analysis. The requirements for blood lead testing are given in subsection (j)(1)(A), which is referenced in this subsection.

Subsection (d)(2)(E)9.
These proposals would redesignate subsection (d)(2)(E)6. as subsection (d)(2)(E)9., and modify the language in this subsection. As an interim protection for employees who perform trigger tasks, training requirements would be expanded to equal those required of employees who are exposed at or above the action level, as specified in subsection (*l*)(1)(B).

This change is necessary to provide greater protection to employees who perform trigger tasks by ensuring that they are provided with comprehensive information about lead.

References to section 5194 and subsection (*l*)(2)(C) would be removed as they are duplicative of the training required by subsections (*l*)(1)(A) and (*l*)(1)(B).

Subsections (d)(3)(D)1. and (d)(3)(D)3.b.
The references in these subsections would be redesignated because of the changed enumeration in subsection (n); the referenced language itself is unchanged.

Subsection (d)(3)(D)2.
The term “trigger task” was added to be consistent with new definitions added in this proposal and to clarify the meaning of the subsection.

Subsection (d)(4)(C)
These proposals would add the word “may” to qualify that the stated conditions may constitute a health hazard, but do not definitely constitute a health hazard. This change is necessary for consistency with LC section 6717, which mandates the requirements of this subsection, and puts the word "may" in front of the word “constitute.”

Also in subsection (d)(4)(C), the term “lead-related tasks” was changed to “trigger tasks” to be consistent with new definitions in this proposal.

Subsection (d)(5)(A)
This subsection requires that the employer make a written record when a determination is made that no employee is exposed to concentrations of airborne lead at or above the action level. These proposals would require a unique identifier (such as date of birth or employee identification number) to be used in place of a social security number (SSN) in written records for each employee monitored.

This change is necessary to comply with a Cal/OSHA directive to remove all requirements in its standards to include employee SSNs on exposure monitoring, medical surveillance, or other records, to facilitate employers’ efforts to safeguard employee privacy. This directive is in response to Federal OSHA’s Standards Improvement Project proposal to remove requirements for including employee SSNs in its regulations.

Subsection (d)(5)(B)
The reference in subsection (d)(5)(B) would be redesignated because of the changed enumeration in subsection (n); the term "lead-related tasks" was changed to "trigger tasks" to be consistent with new definitions in this proposal.

Subsection (d)(6)
This subsection specifies the frequency with which air monitoring must be performed to determine employee exposure to airborne lead. These proposals would not change the currently specified (every 6 months) monitoring frequency for exposure levels at or above 30 μg/m^3 as an 8-hour TWA (the current action level) and the current (every 3 months) monitoring frequency for exposure levels above 50 μg/m^3 as an 8-hour TWA (the current PEL). However, current references to "the PEL" would be replaced by "50 μg/m^3 as an 8-hour TWA," and current references to "the action level" would be replaced by "30 μg/m^3 as an 8-hour TWA." These proposals would also newly require monitoring every 12 months at the proposed action level (2 μg/m^3 as an 8-hour TWA).

These changes are necessary to respond to the lower proposed action level, while also offering employers relief in the area of air monitoring frequency. By maintaining the required frequencies at the air concentrations associated with the current action level and the current PEL, the proposed language is not less protective than the current federal language.

These proposals would modify the language of subsections (d)(6)(B) and (C), redesignate existing subsections (d)(6)(B) and (C) to subsection (d)(6)(C) and (D), respectively, and add new requirements in subsection (d)(6)(B).

Subsection (d)(6)(B)
These proposals would add a new subsection (d)(6)(B), which would establish requirements when initial or subsequent monitoring shows employee exposure to be at or above the action level but below 30 μg/m^3 as an 8-hour TWA. At this level of exposure, monitoring would be required every 12 months.

This addition is necessary to ensure that at least a minimal amount of repeated air monitoring is conducted when an employee's exposure is at or above the proposed action level of 2 μg/m^3. In addition, this change would encourage employers to strive to reduce employee exposures to below 2 μg/m^3 as an 8-hour TWA.

Subsection (d)(6)(C)
In this subsection, the term "action level" would be replaced by "30 μg/m^3 as an 8-hour TWA" and "the PEL" would be replaced by "50 μg/m^3 as an 8-hour TWA."

These changes would retain the monitoring requirements in the existing standard, but are necessary as the action level and PEL would be lowered.

Also in subsection (d)(6)(C), the language would be modified by removing the phrase "in accordance with this subsection" from the requirement that monitoring shall be performed at least every 6 months.

This change is necessary because this phrase adds nothing and is redundant. It is already amply clear that the language in (d)(1), (d)(7), (d)(8) and (d)(9) applies generally without it being explicitly referenced here. The phrase invites possible confusion, or malicious misinterpretation.

In addition, the language of subsection (d)(6)(C) would be modified to require subsequent monitoring when air monitoring shows an exposure below 30 μg/m^3 as an 8-hour TWA, as required by proposed new language in subsection (d)(6)(B).

This change is necessary because under the proposed changes, an employer would be required to continue monitoring until the exposure level is below 2 μg/m^3 as an 8-hour TWA.

Subsection (d)(6)(D)
In this subsection, "the PEL" would be replaced by "50 μg/m^3 as an 8-hour TWA." In addition, language would be added to require quarterly monitoring, based not only on an initial determination, as stated in the existing regulation, but also based on an employee's exposure as determined by a subsequent determination when employee exposure is above 50 μg/m^3 as an 8-hour TWA.

These changes are necessary to notify employers that quarterly monitoring is required when an employee's exposure is above 50 μg/m^3 as an 8-hour TWA, regardless of whether this was determined through an initial or subsequent determination.

Language in subsection (d)(6)(D) referring to the action level would be removed, as monitoring requirements for exposures at or above 30 μg/m^3 as an 8-hour TWA would be given in subsection (d)(6)(C).

In addition, requirements for repeat monitoring would be modified, in that it would be required at the frequency specified in subsection (d)(6)(B) or (C), as appropriate, based on the monitoring results.

This change is necessary to reflect the new monitoring requirements given in subsection (d)(6)(B).

Subsection (d)(9)
This subsection specifies the required accuracy of the methods of monitoring and analysis and determination of lead concentrations in coatings and material that an employer must use.

These proposals would change the concentration of airborne lead at which this accuracy must be met to equal to or greater than 2 $\mu g/m^3$, from the existing concentration of 30 $\mu g/m^3$.

This change is necessary to ensure that accuracy requirements for sampling and analytical methods are met when monitoring for airborne lead at the proposed, lowered action level of 2 $\mu g/m^3$.

In addition, in subsection (d)(9), the required accuracy would be changed from "not less than plus or minus 25 percent," to "not less than plus or minus 20 percent."

This change is necessary to provide consistency with the requirements specified in section 5198.

Subsection (e) Methods of compliance.

Subsection (e)
This subsection establishes requirements for employers to achieve compliance with the PEL.

Subsection (e)(2)
This subsection establishes requirements for a lead compliance program.

Subsection (e)(2)(B)3.
These proposals would modify the language in subsection (e)(2)(B)3. to amend its requirements by adding that the written compliance program shall include a report of any engineering and work practice controls that were considered by the employer but not implemented due to infeasibility, including an explanation of how each was determined to be infeasible.

This amendment is necessary to ensure that employers document the rationale behind their determination that certain control measures would not be feasible.

Also in subsection (e)(2)(B)3., the word "any" would be added before "engineering and work practice controls."

This change is necessary because in some cases there would not be any engineering and work practice controls that were considered in the context of subsection (e)(2)(B)3.

Subsections (e)(2)(E) and (e)(4)
In these subsections, language would be added to require written documentation. In subsection (e)(2)(E), written documentation of revisions and updates to the compliance program would be required. Also language would be added requiring that the revisions and updates be documented in accordance with new recordkeeping language in subsection (n)(2). In subsection (e)(4), written documentation of any job rotation schedule would be required.

These changes are necessary to ensure that these revisions, updates and schedules are made in a formalized manner that can be reviewed at a future time.

Subsection (e)(4)(A)
These proposals would add language to subsection (e)(4)(A) to require that an employee's name and another unique identifier be used when job rotation schedules are established and implemented.

This change is necessary for consistency with language proposed for recording requirements in subsection (d)(5) and elsewhere in the regulation.

Subsection (f) Respiratory protection.

Subsection (f)
This subsection establishes requirements for respiratory protection when employees are required by this section to use respirators.

Subsection (f)(1)(D)
In this subsection, these proposals would replace the phrase "the operations" with "trigger tasks."

This change is necessary for consistency in identifying the activities covered under this subsection.

In addition, these proposals replace the word "specified" with "described."

This change is necessary to include those tasks described in subsection (d)(2)(B).

Subsection (f)(2(A)
In this subsection, non-substantive changes were made to improve clarity.

Subsection (f)(3)(A)
In this subsection, a requirement would be added that would prohibit employers from selecting or using filtering facepiece respirators to protect their employees when respirator use is required.

This amendment is necessary, because filtering facepiece respirators are unlikely to provide adequate protection to employees, due to the difficulty in achieving and maintaining a satisfactory seal on the employee's face.

Subsection (f)(3)(D)
In this subsection, these proposals would add specifications for the type of filters that an employer would be required to provide for non-powered air-purifying respirators, and modify text to clarify that HEPA filters are to be provided for powered air-purifying respirators.

These changes are necessary to reflect NIOSH rules for respirators that were updated in 1995.

Subsection (g) Protective work clothing and equipment.

Subsection (g)
This subsection establishes requirements for protective work clothing and equipment.

Subsection (g)(1)
In this subsection, the word "trigger" would be added before the word "tasks."

This change is necessary for consistency in identifying the activities covered under this subsection.

In addition, these proposals replace the word "specified" with "described."

This change is necessary to include those tasks described in subsection (d)(2)(B).

In addition, these proposals would add in subsection (g)(1) a reference to GISO Article 10.

This amendment is necessary to ensure that all protective clothing and equipment is selected and used in accordance with GISO Article 10 requirements for personal safety devices and safeguards.

A reference to section 1516 would be removed from **subsection (g)(1)(C).**

This change is necessary as section 1516 no longer exists; it was repealed in the past.

In addition, these proposals would modify in **subsection (g)(2)(A)** the exposure level at which an employer would be required to provide, at least daily, clean and dry protective clothing to employees, from 200 $\mu g/m^3$ to 30 $\mu g/m^3$.

This change is necessary to reflect the lower proposed PEL of 10 µg/m^3, and to support the overall goal of reducing and maintaining employees' BLLs below 10 µg/dl. The change also provides consistency with the requirement given in proposed section 5198(g)(2)(A).

Subsection (g)(2)(G)2
This subsection would be removed as the referenced requirement expired on June 1, 2015, and no longer applies.

Subsection (h) Housekeeping.

Subsection (h)
This subsection establishes requirements for cleaning floors and other surfaces.

Subsection (h)(2)
Non-substantive changes were made to clarify the meaning of the subsection.

Subsection (h)(3)
In this subsection, the word "may" would be replaced with "shall."

This change is necessary as the word "may" is not enforceable.

In addition, language in subsection (h)(3) would be amended to require an employer to demonstrate that vacuuming or other equally effective methods have been tried and found not to be effective, before they would be permitted to clean using shoveling, dry or wet sweeping or brushing.

This amendment is necessary to place the burden of proof on an employer to demonstrate that these cleaning methods, normally considered safe and effective, have been tried and found not to be effective, before they would be permitted to clean using methods which are considered to be less safe, such as shoveling, dry or wet sweeping or brushing.

Subsection (i) Hygiene facilities, practices and regulated areas.

Subsection (i)
This subsection establishes requirements for hygiene facilities, practices and regulated areas.

Subsection (i)(1)
These proposals would expand subsection (i)(1). In addition, a heading, "General hygiene" would be added.

This amendment is necessary to indicate that the requirements of subsection (i)(1) are general in nature.

These proposals would add subsections (i)(1)(A), (B) and (C).

Subsection (i)(1)(A)
In this subsection, the existing requirements for employers to prohibit food, beverages, tobacco products and cosmetics would be expanded to include all areas where employees are exposed to lead, rather than only to areas where the PEL is exceeded.

This change is necessary to provide greater protection to employees from the hazard of lead ingestion, which may occur in areas where the hands of employees can become contaminated with lead, even when airborne levels of lead are below the PEL.

Subsection (i)(1)(B)
This new subsection would include language currently found in subsection (i)(5)(A). In addition, language would be added, requiring employers to provide special cleansing compounds. This subsection would also include a reference to section 1527(a), which establishes requirements for the provision of washing facilities and special cleansing compounds to remove lead from the skin.

This addition is necessary, as simple soap and water may not be adequate to remove lead from employees' skin. Lead contamination on the skin of employees increases the possibility of lead ingestion.

Subsection (i)(1)(C)
This new subsection would include a requirement, currently found in subsection (i)(4), that employers ensure that employees wash before eating, drinking, smoking or applying cosmetics. In subsection (i)(1)(C), this requirement would be expanded such that employees exposed to lead, even if below the PEL, would be included. Also, the washing requirements would be expanded, to include washing exposed arms. In addition to requirements for washing before eating, drinking, smoking or applying cosmetics, employers would be required to ensure that employees exposed to lead wash prior to entering eating areas, and at the end of their shift.

These amendments are necessary to provide greater protection to employees from the hazard of lead ingestion due to lead that may be on their exposed arms, in addition to their hands and face.

Subsection (i)(2)(A)
In this subsection, the word "trigger" would be added before the word "tasks."

This change is necessary for consistency in identifying the activities covered under this subsection.

In addition, these proposals replace the word "specified" with "described."

This change is necessary to include those tasks described in subsection (d)(2)(B).

These proposals would amend the requirements of **subsection (i)(3).**

Subsection (i)(3)(A)
This subsection would be amended to require employers to provide shower facilities as an interim protection for employees conducting level 3 trigger tasks as listed in subsection (d)(2)(D), and also to remove the term "where feasible" from the requirements.

These changes are necessary to provide greater protection for employees who work in areas that either have or are presumed to have high airborne concentrations of lead by ensuring that showers are provided.

Subsection (i)(3)(A)
In this subsection, the phrase "without regard to the use of respirators" would be added.

This amendment is necessary to provide consistency with the requirements in subsection (i)(4), which explicitly state that airborne exposure above the PEL is without regard to the use of respirators.

Subsection (i)(3)(B)
This subsection would be redesignated as subsection (i)(3)(C), and a new subsection (i)(3)(B) would be added.

Subsection (i)(3)(B)
A reference would be made to section 3366(f), which establishes requirements for the provision of showers, cleansing agents and towels.

This addition is necessary to provide clarity to employers about the specific requirements for providing shower facilities.

Subsection (i)(3)(C)
This subsection would be amended to make clear that employers are required to ensure employee use of showers where showers are required.

This amendment is necessary because of the elimination of "where feasible" from subsection (i)(3)(A). It also avoids mistaken interpretation.

Subsection (i)(4)
These proposals would amend the requirements of subsection (i)(4)**.**

Subsection (i)(4)(A)
This subsection would be amended by adding the requirement to provide lunchroom facilities or eating areas as an interim protection for employees conducting trigger tasks.

This addition is necessary to provide greater protection to employees who work in areas that are presumed to have high airborne concentrations of lead by ensuring that a clean area is provided for eating to reduce the likelihood of lead ingestion.

The requirement given in existing subsection (i)(4)(B) that required lunchroom facilities or eating areas be readily accessible to employees would be moved to subsection (i)(4)(A). Also, existing subsection (i)(4)(B) would be removed, as its requirements would be moved to subsections (i)(4)(A) and (i)(5). Existing subsection (i)(4)(C) would also be removed, as its requirements would be moved to subsection (i)(1).

Subsection (i)(4)(B)
Existing subsection (i)(4)(D) would be redesignated as subsection (i)(4)(B), and the language would be modified to specify that when vacuums are used to remove surface lead dust from protective clothing or equipment, they must be HEPA vacuums.

This addition is necessary to ensure that vacuums used to remove surface lead dust sufficiently limit the dispersion of lead dust, and the resulting inadvertent exposure of employees to this lead dust.

Subsection (i)(5)
These proposals would amend the heading of subsection (i)(5) from “Hand Washing facilities” to “Cleaning of hygiene facilities.”

These changes are necessary as the requirements for hand washing would be moved to subsection (i)(1).

Also in subsection (i)(5), language would be added that requires employers to develop and implement written methods and schedules to maintain the cleanliness of the hygiene facilities required by subsection (i).

This addition is necessary to require employers to have a documented system in place to ensure that required hygiene facilities are maintained in a clean condition, so that the likelihood of ingestion of lead is reduced.

These proposals would remove existing subsections (i)(5)(A) and (B).

This change is necessary, as the requirements in existing subsection (i)(5)(A) would be moved to subsection (i)(1)(B), while the requirements in existing subsection (i)(5)(B) would be moved to subsection (i)(1)(C).

Subsection (i)(6)
These proposals would modify the language in subsection (i)(6).

Subsection (i)(6)(A)
Language would be added in subsection (i)(6)(A) that would require employers to establish regulated areas for specified work areas, unless they can demonstrate that regulated areas are not feasible.

This change is necessary to place the burden of proof on an employer to demonstrate that establishing a regulated area is not feasible.

In addition, the language in subsection (i)(6)(A) would be amended to state that regulated areas are required where employees are exposed above the PEL, rather than at or above the PEL.

This change is necessary to provide consistency with all other requirements in this section, which are dependent on the PEL being exceeded.

Also, language in subsection (i)(6)(A) would be added to clarify that employee exposure to lead without regard to the use of respirators applies to requirements for establishing regulated areas.

This amendment is necessary to provide consistency with the requirements in subsection (i)(4), which explicitly state that airborne exposure above the PEL is without regard to the use of respirators.

In addition, the phrase “and as interim protection for employees” would be added.

This addition is necessary to clarify that the requirement applies to employees performing trigger tasks prior to assessment of exposure.

Subsection (i)(6)(B)
In this subsection, a correction would be made to indicate that signage requirements are described in subsection (m)(1), not subsection (m)(2).

Subsection (j) Medical surveillance.

Subsection (j)
This subsection establishes requirements for the provision of medical surveillance.

Subsection (j)(1)(A)
These proposals would modify the language in subsection (j)(1)(A) by changing the phrase "initial medical surveillance" to "initial blood lead testing."

This change is necessary as existing requirements for ZPP sampling and analysis would be removed from the blood lead testing requirements proposed in subsection (j)(2). Kosnett et al. (2007) reported that routine measurement of ZPP is not recommended because it is an insensitive biomarker of lead exposures in individuals with blood lead concentrations below 25 µg/dl. Therefore, ZPP testing would only be required as part of a medical examination, pursuant to subsection (j)(3), for employees with blood lead levels at or above 20 µg/dl. Thus, subsection (j)(2) would establish requirements related only to blood lead testing and analysis. A second reason this change is necessary is to clearly differentiate the requirements in subsection (j)(1)(A), for employers to provide initial blood lead testing, from the requirements to provide more comprehensive medical surveillance, including follow-up blood lead testing and medical examinations and consultations, to employees specified in subsection (j)(1)(B).

These proposals would also modify the requirements of subsection (j)(1)(A) such that employers would be required to make available initial blood lead testing for employees prior to assignment to work where exposure to lead is or is reasonably expected to be at or above the action level, and as interim protection, prior to conducting trigger tasks as described in subsection (d)(2), unless a negative initial determination has been made as described in subsection (d)(5).

These changes to subsection (j)(1)(A) are necessary to establish baseline BLLs of employees before they begin to work that involves significant, or presumed significant, airborne levels of lead. In this way, employees would have a baseline BLL against which to measure the results of subsequent tests. Also, any pre-existing elevation in an employee's BLL, whether occupational or non-occupational, could be identified, and employees with pre-existing elevated BLLs could be protected from further exposure to lead.

Subsection (j)(1)(B)
These proposals would expand the scope of subsection (j)(1)(B) by reducing the amount of lead exposure allowed before medical surveillance must be made available to an employee.

subsection (j)(1)(B)1.
In this subsection, employers would be required to institute a medical surveillance program for employees who are or may be exposed to lead at or above the action level. An exception would

be given if an employee is not exposed at or above the action level for 10 or more days in any 12 consecutive months, and is not exposed on any day at or above 100 µg/m^3 as an 8-hour TWA, without regard to respirator use. This is a change from the existing threshold for a medical surveillance program of exposure for more than 30 days in any consecutive 12 months at or above the action level.

This amendment is necessary to support the overall goal of maintaining employee BLLs below 10 µg/dl. Employees exposed to lead for up to 30 days a year, as is currently allowed, may well develop BLLs above 10 µg/dl, and yet not be covered by medical surveillance. Likewise, employees who are exposed to lead at or above 100 µg/m^3 as an 8-hour TWA on any day may develop elevated BLLs, even though these exposures may be infrequent. Significantly, blood lead testing detects elevated BLLs that occur due to ingestion of lead, as well as due to inhalation of airborne lead. Expanded medical surveillance means that increasing BLLs would be detected earlier, and lead-related adverse health effects would be detected at an earlier stage, thus preventing more severe employee health damage.

These proposals would use a formal exception to specify when medical surveillance is not required for employees covered by subsection (j)(1)(B)1.

This is necessary to make clear that, if the exception is claimed, it is the employer's duty to ensure and be able to demonstrate that the conditions of the exception are met.

Subsection (j)(1)(B)2.
In this subsection, employers would be required to institute a medical surveillance program, as interim protection, for employees who perform trigger tasks. Exceptions to this are given if a negative initial determination has been made in accordance with subsection (d)(5), or if an employee only performs level 1 trigger tasks and does not perform these tasks for 10 or more days in any consecutive 12 months. Currently, employers are required only to provide, as interim protection, initial BLL/ZPP testing for employees who perform trigger tasks. This leaves significantly exposed employees, with lead exposures assumed to be above the PEL, not covered by medical surveillance. Requiring medical surveillance, as interim protection for employees who perform trigger tasks, as a default ensures these exposed employees are covered, irrespective of the timing of an employer's compliance with exposure monitoring requirements.

This amendment is necessary to ensure that rising BLLs and lead-related adverse health effects are detected early, and supports the overall goal of maintaining employee BLLs below 10 µg/dl.

These proposals would use formal exceptions to specify when medical surveillance is not required for employees covered by subsection (j)(1)(B)2.

This is necessary to make clear that, if an exception is claimed, it is the employer's duty to ensure and be able to demonstrate that the conditions of the exception are met.

Subsection (j)(1)(E)
These proposals would add a new subsection (j)(1)(E) which would establish requirements for employers to provide complete employee demographic information to healthcare providers who perform medical surveillance under subsections (j)(2) or (j)(3) of this standard, and also require employers to instruct these healthcare providers to provide laboratories that analyze blood lead tests with the employee demographic information.

This addition is necessary so that more complete demographic information would be provided to the California Occupational Blood Lead Registry, as required by the California Health and Safety Code 124130. Laboratories performing lead analyses on blood samples drawn in California are required by law to report electronically all results to CDPH. Reports of adult BLLs are then entered into the California Occupational Blood Lead Registry. This information is then used to identify cases of occupational lead poisoning that must be investigated by CDPH, as well as to target employers and industries for CDPH's occupational lead poisoning prevention efforts. The proposed language in subsection (j)(1)(E) closely follows language in the California Health and Safety Code 124130, which mandates information that laboratories must report to CDPH.

Subsection (j)(2)
These proposals would change the heading of subsection (j)(2) from "Biological monitoring" to "Blood lead testing."

This change is necessary as subsection (j)(2) would establish requirements related only to blood lead testing and analysis, as the ZPP test would no longer be a routine part of medical surveillance (see discussion of ZPP in subsection (j)(1)(A) above).

Subsection (j)(2)(A)
This subsection establishes requirements for the timing and frequency with which blood lead testing must be made available to employees.

The heading of subsection (j)(2)(A) would be changed from "Blood lead and ZPP level sampling and analysis" to "Blood lead testing schedule." Also, a reference to biological monitoring would be removed, along with references to ZPP, and the term "blood sampling and analysis" would be replaced by "blood lead testing."

The changes are necessary as subsection (j)(2)(A) would apply only to blood lead testing (see discussion of ZPP in subsection (j)(1)(A) above).

In addition, in subsection (j)(2)(A), the reference to each employee covered under "subsections (j)(1)(A) and (B)" would be changed to "subsection (j)(1)(A) or (B)." This change has no regulatory effect and is necessary to correct an error made in the exiting regulation. The word "and" was erroneously used when the intended meaning is clearly and logically "or."

Subsection (j)(2)(A)
These proposals would amend the requirements given in subsection (j)(2)(A) for the timing and frequency of blood lead testing which employers are required to make available to specified employees.

Subsection (j)(2)(A)1.
In this subsection, a reference would be added to subsection (j)(1)(A).

This addition is necessary to clarify that employees who are covered under subsection (j)(1)(B) need to be provided with initial blood lead testing required by subsection (j)(1)(A).

Subsection (j)(2)(A)2.
New language would be added under the designation subsection (j)(2)(A)2. which would require blood lead tests to be provided at least every 2 months for the first 6 months after a change in task resulting in, or likely to result in, higher exposure to lead, and then every 6 months thereafter.

This addition is necessary as it is important to more frequently monitor an employee's BLL when their exposure to lead is increased. Increased exposure may lead to a sudden rise in an employee's BLL, which must be detected early.

Subsection (j)(2)(A)3.
In this subsection**,** these proposals would modify language currently found under the designation subsection (j)(2)(A)2. In subsection (j)(2)(A)3., a reference to each employee "covered under subsections (j)(1)(A) or (B)" would be removed.

This change is necessary to eliminate a redundancy, as the language in subsection (j)(2)(A) would indicate that the subsection applies to each employee covered under subsections (j)(1)(A) or (B).

The phrase "blood sampling and analysis indicated a" would be removed before the words "blood lead level," and the phrase "blood samples and analysis" would be changed to "blood lead levels."

These changes are necessary to reflect the removal of ZPP testing requirements from this subsection (see discussion of ZPP in subsection (j)(1)(A) above).

In addition, blood lead testing would be required to be made available at least every two months for an employee whose last BLL was at or above 10 µg/dl but below 20 µg/dl of whole blood, rather than the existing requirement for blood lead testing to be made available every two months when an employee's BLL is at or above 40 µg/dl. Providing testing every 2 months would be required to continue until two consecutive BLLs, taken at least 30 days apart, are below 10 µg/dl, rather than the existing requirement of two consecutive BLLs of 40 µg/dl.

These amendments are necessary to ensure that any BLL at or above 10 µg/dl is closely monitored until it is reduced to below 10 µg/dl. This supports the overall goal of maintaining employee BLLs below 10 µg/dl.

Subsection (j)(2)(A)4.
In this subsection, these proposals would modify language currently found under the designation subsection (j)(2)(A)3. In subsection (j)(2)(A)4., a requirement for making blood lead testing available at least monthly for employees whose last BLL was at or above 20 µg/dl would be added.

This addition is necessary, because by requiring the provision of periodic and repeated blood lead testing on a more frequent basis and at lower BLLs, elevations in an employee's BLL would be discovered earlier, enabling an employer to take actions to reduce the employee's exposure to lead. In this way, employees' BLLs would be reduced and the prevalence of adverse health effects from exposure to lead would be reduced.

Subsections (j)(2)(A)5. and 6.
These proposals would add new subsections (j)(2)(A)5. and 6. These subsections would add requirements for the provision of blood lead testing at least monthly as an interim protection for employees who perform level 3 trigger tasks, and for employees whose airborne exposure is above 500 µg/ m^3 as an 8-hour TWA, without regard to the use of respirators. A blood lead test would have to be provided to these employees within 3 days after discontinuing either level 3 trigger task work or work associated with airborne exposure above 500 µg/m^3.

These additions are necessary as frequent testing of employees with exposure to high or presumed high levels of airborne lead would identify employees with elevated BLLs and cause employers to take steps to reduce exposure to lead from both oral and airborne routes of exposure. Also, testing employees within 3 days after discontinuing level 3 trigger task work or work associated with airborne exposure above 500 µg/m^3 would provide both employers and employees with important information about the effect of this work on employees' BLLs so that it could be distinguished from the effects on BLLs from other work that employees perform.

Subsection (j)(2)(B)
These proposals would remove the existing language in subsection (j)(2)(B). This language requires a second, confirmatory blood lead test be conducted whenever an employee's BLL

exceeds the criterion for medical removal protection, before the employee is removed from on-going exposure.

This change is necessary to provide greater protection of employee health. It is more protective of an employee's health to not be required to wait for confirmatory results from a mandated follow-up blood lead test before removing an employee from exposure to lead. This change is facilitated by the increased reliability of blood lead testing and analysis since the time the regulation was promulgated in 1993.

Subsection (j)(2)(B)
These proposals would replace the existing language in subsection (j)(2)(B), which was removed, with language previously found under the designation subsection (j)(2)(C). Proposed subsection (j)(2)(B) establishes requirements for the accuracy of blood lead testing. References to "blood lead level sampling and analysis" would be replaced with "blood lead testing."

This change is necessary for consistency with the language that is proposed throughout this subsection.

These proposals would remove the requirement that blood lead testing meet a stated accuracy, and be conducted by a laboratory licensed by Federal OSHA, and replace it with a requirement that blood lead testing include analysis by a CLIA-approved laboratory (under the federal Clinical Laboratory Improvement Amendments (CLIA) regulations).

This change is necessary because Federal OSHA no longer directly approves blood lead testing laboratories; Federal OSHA recognizes that the CLIA criteria for blood lead proficiency testing constitute the federal government's legal requirements for laboratories performing human blood lead testing.

Subsection (j)(2)(C)
These proposals would move and modify language currently found under the designation subsection (j)(2)(D) to subsection (j)(2)(C). The term "biological monitoring" would be replaced by "blood lead test."

This is necessary because the requirements in this subsection would pertain to blood lead testing only.

In addition, these proposals would change the heading of this subsection.

This change is necessary to distinguish its requirements from those that would be created in proposed subsection (j)(2)(D).

Subsection (j)(2)(C)1.
In this subsection, a reference to "his or her" would be replaced with "that employee's."

This change is necessary for consistency with the existing language of section 5198(j)(2)(E)1. and for greater clarity.

Subsection (j)(2)(C)2.
These proposals would replace the current language in subsection (j)(2)(D)2. with new language in proposed subsection (j)(2)(C)2. These proposals would add, to a currently-required written notification to employees, a requirement that employers notify employees about medical examinations and consultations that employers must make available. The proposal would also add that employers must make a medical examination and consultation available as soon as possible upon notification from an employee that the employee has signs of lead toxicity, desires medical advice or has demonstrated difficulty breathing during a respirator fit test or during use. The requirement to make these examinations and consultations available is located in subsection (j)(3)(A).

This addition is necessary to provide information, and thus greater health protection, to employees about the medical examinations and consultations that are available to them under subsection (j)(3)(A).

Subsection (j)(2)(C)3.
These proposals would modify language currently found under the designation subsection (j)(2)(D)2. and move it to subsection (j)(2)(C)3. Proposed subsection (j)(2)(C)3. establishes the requirements for employee notification about temporary medical removal with Medical Removal Protection (MRP) benefits. The language would be modified to require employers to notify all employees, regardless of their BLL, about MRP and its benefits when they are notified of their BLL. In addition, employers would be required to notify employees of the specific BLL criteria for medical removal under subsection (k)(1)(A).

These modifications are necessary to provide information, and thus greater health protection, by ensuring that all employees who have their BLL tested are made aware of temporary medical removal, the criteria for removal and MRP benefits. This would also help ensure continued employee participation in future BLL testing.

Subsection (j)(2)(D)
These proposals would establish a new subsection (j)(2)(D) with the heading "Physician's notification to the employee." Subsection (j)(2)(D) would require the employer to ensure that the physician who orders a blood test for an employee explains the findings of the blood lead test, and notifies the employee of any recommended follow-up blood lead testing in accordance with subsection (j)(2)(A), and medical examination.

This addition is necessary to ensure that employees receive information directly from the physicians who order their blood lead tests so that employees gain a better understanding of the significance of their blood lead test results.

Subsection (j)(2)(E).
These proposals would establish a new subsection (j)(2)(E). Subsection (j)(2)(E) would require a response by employers when an employee has a BLL at or above 10 µg/dl. In that event, the employer would be required to establish and implement a written elevated blood lead level response plan with a description of means that would be used to reduce and maintain that employee's BLL below 10 µg/dl. This plan would be accompanied by any needed training and instruction to correct employee work practices, as identified by the plan.

This addition is necessary to provide greater health protection to employees in that employers would be required to take steps to reduce elevated employee BLLs, even though they may not reach a level at which temporary medical removal is required. This supports the overall goal of maintaining all employee BLLs below 10 µg/dl.

Subsection (j)(3)
This subsection establishes requirements for medical examinations and consultations. Employers are required to make medical examinations and consultations available, as specified in subsection (j)(3), to each employee covered under subsection (j)(1)(B).

Subsection (j)(3)(A)
This subsection specifies the frequency with which medical examinations and consultations must be made available. These proposals would amend this subsection as detailed below.

Subsection (j)(3)(A)1.
In this subsection, these proposals would replace a reference to "blood sampling test" with "blood lead test."

This amendment is necessary to provide consistency with the language proposed for use throughout this standard.

Also in subsection (j)(3)(A)1., the BLL at which medical exams and consultations would be required to be made available to employees would be lowered from at or above 40 µg/dl to at or above 20 µg/dl.

This amendment is necessary to provide greater health protection to employees exposed to lead, in that an examination conducted when an employee's BLL is 20 µg/dl would detect lead-related adverse health effects at an earlier stage than an examination conducted when an employee's BLL reaches 40 µg/dl.

In addition, these proposals would amend the existing language in subsection (j)(3)(A)1. to require that the subject medical examinations be made available as soon as possible, if no lead-specific medical examination was done for that employee in the preceding 12 months.

This amendment is necessary to provide greater health protection to employees by ensuring that these employees are provided with medical examinations and consultations in a timely manner when an elevated BLL has been identified, while allowing that such an examination need only be performed once in a 12 month period.

Current subsections (j)(3)(A)2. and 3. would be redesignated as subsections (j)(3)(A)3. and 4., respectively.

Subsection (j)(3)(A)2.
In this subsection, language would be added to require employers to make medical examinations and consultations available prior to assignment for each employee covered by subsection (j)(1)(B).

This amendment is necessary to provide greater health protection to employees who are exposed to lead. Requiring employers to make medical examinations and consultations available prior to assignment for the specified employees would provide a baseline assessment of the health of employees before they begin to work in areas with significant airborne levels of lead. In this way, pre-existing health-related conditions, whether occupational or non-occupational, could be identified, and employees with pre-existing conditions could be protected, if medically necessary, from further exposure to lead. This amendment is also necessary for consistency with the current requirements of section 5198(j)(3)(A)2.

Subsection (j)(3)(A)3.
In this subsection, these proposals would amend the term “fitting test” to “fit test.”

This change is necessary to correctly identify the test by referring to it by its proper name.

Subsection (j)(3)(A)4.
In this subsection**,** these proposals would modify the language currently located in subsection (j)(3)(A)3. to specify that the medical exams and consultations employers are required to make available to employees removed from exposure to lead are to be made available as soon as possible.

This amendment is necessary to provide greater health protection to employees by ensuring that these employees are provided with medical exams and consultations in a timely manner, and also for consistency with subsection (j)(3)(A)3.

In addition, language in proposed subsection (j)(3)(A)4. would be amended to include the requirement that medical examinations and consultations are to be provided to employees removed from exposure to lead due to elevated BLLs as required by subsection (k)(1)(A).

Although this requirement is also found in subsection (j)(3)(A)1., it is necessary to amend subsection (j)(3)(A)4. to state the requirement explicitly because subsection (j)(3)(A)4. specifically addresses employees who are removed from exposure to lead, while subsection (j)(3)(A)1. does not.

Also, the language in proposed subsection (j)(3)(A)4. would be amended to delete the term "a risk of sustaining material impairment to health" and add language to specify that medical examinations and consultations are to be made available to each employee whose exposure to lead is otherwise limited pursuant to a final medical determination as required by subsection (k)(1)(B).

This amendment is necessary to more clearly state the requirement, because the term "a risk of sustaining material impairment to health" is vague and ambiguous.

Subsection (j)(3)(B)
This subsection establishes the content of medical evaluations and consultations required by this section.

Subsection (j)(3)(B)
In the first sentence of subsection (j)(3)(B), the requirement that the content of medical examinations made available pursuant to subsections (j)(3)(A)2. – 3. be determined by an examining physician would be removed. In the proposed language, rather than being determined by an examining physician, the content of all medical examinations made available pursuant to subsection (j)(3)(A) would be specified in subsection (j)(3)(B)1. – 6.

This amendment is necessary to provide greater health protection to employees by ensuring that all medical examinations made available pursuant to subsection (j)(3)(A) include the elements necessary to diagnose adverse health effects related to an employee's exposure to lead, as well as pre-existing health-related conditions that could be exacerbated by exposure to lead. The examining physician would retain the ability to order any other test relevant to lead exposure they deem necessary by sound medical practice, under the provisions of subsection (j)(3)(B)6.

Subsection (j)(3)(B)2.
In the first sentence of subsection (j)(3)(B), the requirement that the content of medical examinations made available pursuant to subsections (j)(3)(A)2. – 3. include a pregnancy test or laboratory evaluation of male fertility, if requested by an employee, would be removed. This

requirement would be added to subsection (j)(3)(B)2., where it would apply to all medical examinations made available pursuant to subsection (j)(3)(A).

These changes are necessary, as the requirement would apply to the required content for all medical examinations made available pursuant to subsection (j)(3)(A), and thus provide greater health protection to employees. This requirement, which evaluates the reproductive system, is appropriate to include in subsection (j)(3)(B)2., which lists the bodily systems that are to be included in a thorough physical examination.

Subsection (j)(3)(B)4.c.
In this subsection, the requirement for ZPP testing would be amended in that it would be required only for those employees whose last BLL was at or above 20 µg/dl.

This amendment is necessary because zinc protoporphyrin is an insensitive biomarker of lead exposures in individuals with blood lead concentrations below 25 µg/dl, and is no longer recommended for routine measurement (Kosnett et al., 2007).

Subsection (j)(3)(D)
These proposals would modify the language in subsection (j)(3)(D).

Subsection (j)(3)(D)1.e.
In this subsection, the word "determinations" would be replaced by "test results."

This amendment is necessary for greater clarity and to avoid confusion with other uses of the word "determination" in this standard.

Subsection (j)(3)(D)1.g.
Also, these proposals would add a new subsection, (j)(3)(D)1.g., which would require that employers provide, to an initial physician conducting a medical examination or consultation under this section, a copy of the employer's written elevated blood lead level response plan required by subsection (j)(2)(E)1.

This addition is necessary to ensure the physician has accurate information about the means the employer will use to reduce and maintain the employee's BLL below 10 µg/dl.

Subsections (j)(3)(E) and (F)
These proposals would move the requirements currently located in subsection (j)(3)(E) to proposed subsection (j)(3)(F).

Subsection (j)(3)(E)
The heading of subsection (j)(3)(E) would be changed to "Physician's written medical report for the employee." In addition, these proposals would add new language to establish a

requirement for the employer to ensure that an explanation and written report is provided directly from the physician to the employee within 30 days following a medical examination. The requirements for the written report are contained in proposed subsections (j)(3)(E)1. – 6.

These amendments are necessary to ensure that employees receive information directly from the physician who performs a medical examination for them about any recommended follow-up blood lead testing and medical examinations, as well as the physician's opinion as to whether the employee has any medical condition, occupational or non-occupational, that dictates further medical examination or treatment. The new language in subsection (j)(3)(E) is adapted from the medical surveillance language in the Construction Safety Orders, section 1532.3(h)(5) (Occupational Exposures to Respirable Crystalline Silica). Section 1532.3(h)(5) sets a precedence for the employer being required to ensure the physician communicates results and next steps to the employee directly. Other regulations, directly governing physicians, require that physicians communicate this information to their patients. However, it is necessary to include this requirement in the lead regulation because physicians who conduct medical examinations required by the lead regulation may feel that, because they are under contract with the employer, they must wait for the employer to take the first step in communicating results to employees and arranging for follow-up medical examinations. This amendment is also necessary to avoid any gap in medical care related to lead medical surveillance that may result due to indirect communication of medical information to the employee.

Subsection (j)(3)(F)
The heading for subsection (j)(3)(F) would be amended to "Physician's written medical opinion for the employer."

This change is necessary to distinguish the "physician's written medical opinion for the employer," which would be required by subsection (j)(3)(F), from the "physician's written medical report for the employee," which would be required by subsection (j)(3)(E).

The requirements in revised subsection (j)(3)(F) would include the requirements given in existing subsection (j)(3)(E), with a few modifications as detailed below.

Subsection (j)(3)(F)1.
In subsection (j)(3)(F)1., language would be added to require employers to obtain a written medical opinion from the examining physician within 30 days of the medical examination.

This addition is necessary to ensure that the employer obtains the written medical opinion from the examining physician in a timely manner, such that the employer can comply with the proposed requirement of subsection (j)(3)(F)3.

Subsection (j)(3)(F)1.a.
These proposals would modify the language redesignated as subsection (j)(3)(F)1.a. to add a requirement that each written medical report from an examining or consulting physician include an opinion as to whether an employee has any detected condition that would place the employee's ability to procreate a healthy child at risk due to exposure to lead. In addition, the word "medical" would be replaced by the term "health-related." These changes would make references to "the ability to procreate a healthy child" in language that is not gender-specific, and without using the word "pregnancy." The wording "ability to procreate a healthy child" is used in the existing language of subsection (j)(3)(A)2.

These changes are necessary to avoid, by implication, calling pregnancy a "medical condition," and to make clear that an employee's reproductive health, including pregnancy, is protected as part of the employee's overall health.

Subsection (j)(3)(F)1.d.
In the language redesignated as subsection (j)(3)(F)1.d., the phrase "results of the blood lead determinations" would be replaced with "employee's blood lead test results."

This change is necessary to clarify that the written medical opinion must include blood lead test results for the employee who had the examination. The change is also necessary to avoid confusion with other uses of the word "determination" in this standard.

Subsection (j)(3)(F)3.
In new language proposed in subsection (j)(3)(F)3., a requirement is added for the employer to ensure that the employee receives a copy of the physician's written medical opinion within 30 days of each medical examination performed.

This addition is necessary to ensure that the employee receives the physician's written medical opinion in a timely manner. This requirement is adapted from the medical surveillance language in the Construction Safety Orders, section 1532.3(h)(6)(C) (Occupational Exposures to Respirable Crystalline Silica).

Subsection (j)(3)(G)
These proposals would redesignate subsection (j)(3)(F) and its current requirements as subsection (j)(3)(G).

Subsection (j)(4)(A)
In addition, in subsection (j)(4)(A), the term "he/she" would be replaced with "the employer." This change is necessary for greater clarity.

Subsection (k) Medical removal protection.

Subsection (k)
This subsection establishes requirements for medical removal protection (MRP).

Subsection (k)(1)
This subsection establishes requirements for the temporary removal of an employee from specified working conditions when an employee's BLL is elevated as described in subsection (k)(1)(A), or when temporary removal is due to a final medical determination as described in subsection (k)(1)(B).

Subsection (k)(1)(A)
These proposals would add to subsection (k)(1)(A) new subsections (k)(1)(A)1.-3., which would specify the BLLs at which employees must be removed from work with lead, as described in subsection (k)(1)(A). The existing requirement is that an employee must be removed from work with lead when a periodic and a follow-up blood lead test indicate that the employee's BLL is at or above 50 µg/dl. These proposals would establish three conditions under which an employer would be required to remove an employee from work with lead, as described in subsection (k)(1):

(1) **(k)(1)(A)1.** would establish the requirement that an employee be removed from work with lead as described in subsection (k)(1)(A) when their last BLL is at or above 30 µg/dl;
(2) **(k)(1)(A)2.** would establish, one year after the effective date, the requirement that an employee be removed from work with lead as described in subsection (k)(1)(A) when their last two BLLs are at or above 20 µg/dl; and
(3) **(k)(1)(A)3.** would establish, one year after the effective date, the requirement that an employee be removed from work with lead as described in subsection (k)(1)(A) when the average of all of their BLLs in the prior six months is at or above 20 µg/dl.

These changes are necessary to provide added health protection to employees whose BLLs are elevated, such that they are at risk of experiencing or developing adverse health effects as the result of their exposure to lead, and are based on the recommendations of Kosnett et al. (2007). The one year delay in the effective dates of subsections (k)(1)(A)2. and (k)(1)(A)3. is necessary in order to allow time for compliance with subsection (k)(1)(A)1. to reduce the impact on employers of complying with subsections (k)(1)(A)2. and (k)(1)(A)3.

Subsection (k)(1)(A)1.
In addition, in subsection (k)(1)(A)1., existing language would be removed that requires a second, confirmatory blood lead test be conducted whenever an employee's BLL exceeds the criterion for medical removal protection, before the employee is removed from on-going lead exposure.

This change is necessary to provide greater protection of employee health. It is more protective of an employee's health to not be required to wait for confirmatory results from a mandated follow-up blood lead test before removing an employee from exposure to lead. This change is facilitated by the increased reliability of blood lead testing and analysis since the time the regulation was promulgated in 1993.

Subsection (k)(1)(A)3.
The addition of the removal criterion given in subsection (k)(1)(A)3. is necessary to ensure that MRP is not avoided by employers through the persuasion of employees to decline follow-up blood testing after one of their BLLs is at or above 20 µg/dl.

Subsection (k)(1)(B)1.
These proposals would modify the language in subsection (k)(1)(B)1. to expand the conditions under which employers would be required to remove an employee from work with lead as described in subsection (k)(1)(B), to include each occasion that a final medical determination results in a medical finding, determination, or opinion that such an employee has a detected condition that would place the employee's ability to procreate a healthy child at risk due to exposure to lead. In addition, the word "medical" would be replaced by the term "health-related." These changes would make references to "the ability to procreate a healthy child" in language that is not gender-specific, and without using the word "pregnancy." The wording "ability to procreate a healthy child" is used in the existing language of subsection (j)(3)(A).

These changes are necessary to avoid, by implication, calling pregnancy a "medical condition," and to make clear that an employee's reproductive health, including pregnancy, is protected as part of the employee's overall health. The term "medical condition" has been replaced with "health-related condition" throughout the proposed regulation for the same reasons. In addition, new proposed language exclusively uses the term "health-related condition" for clarity and consistency.

These proposals would add the requirement that employers remove employees placed on MRP from work involving a trigger task when an exposure assessment has not been completed, and from altering or disturbing any material containing lead at a concentration equal to or greater than 0.5% by weight.

These additions are necessary to prevent all significant lead exposure to employees who are placed on MRP.

Subsection (k)(1)(C)
This subsection establishes conditions for the return of an employee to their former job status following medical removal.

Subsection (k)(1)(C)1.a.
These proposals would modify the language of subsection (k)(1)(C)1.a. to clarify that this subsection applies to employees removed under the provisions of subsection (k)(1)(A). A reference to "blood sampling tests" would be changed to "blood lead tests."

These modifications are necessary for clarity and consistency with proposed language throughout this standard.

In addition, the language in subsection (k)(1)(C)1.a. would be changed, such that the BLL that must be achieved for an employer to return an employee to his or her former job status would be changed from below 40 µg/dl to below 15 µg/dl.

This change is necessary to provide added protection to employees who have elevated BLLs by preventing additional exposure to lead until their BLLs decline to significantly below the level at which MRP is required.

Also, language would be added to require that when an employee has been medically removed under the provisions of subsection (k)(1)(A), the employer shall return an employee to his or her former job status when two consecutive tests, taken at least 30 days apart, both indicate that the employee's BLL is below 15 µg/dl.

This change is necessary to ensure that a decline in an employee's BLL is persistent over a 30 day period rather than being a short-lived condition.

Subsection (k)(1)(C)1.b.
These proposals would add language in subsection (k)(1)(C)1.b. to establish that when an employee is removed from work with lead due to a final medical determination, the employee's return to his or her former job status would be dependent on a subsequent final medical determination that the employee no longer has a detected condition that would place the employee's ability to procreate a healthy child at risk due to exposure to lead. In addition, the word "medical" would be replaced by the term "health-related." These changes would make references to "the ability to procreate a health child" in language that is not gender-specific, and without using the word "pregnancy." The wording "ability to procreate a healthy child" is used in the existing language of subsection (j)(3)(A).

These changes are necessary to avoid, by implication, calling pregnancy a "medical condition," and to make clear that an employee's reproductive health, including pregnancy, is protected as part of the employee's overall health.

Subsection (k)(1)(E)
These proposals would modify the language in subsection (k)(1)(E) such that the term "alternate medical determination mechanism" would be changed to "alternate physician determination mechanism."

This change is necessary to provide consistency with existing language proposed for redesignation as subsection (j)(3)(G).

Subsection (k)(1)(E)2.
These proposals would modify the language in subsection (k)(1)(E)2. such that the two exceptions given, currently designated as a. and b., would be listed as Exception 1 and Exception 2.

This change is necessary to correct a grammatical error in the existing language.

Subsection (*l*) Communication of hazards.

Subsection (*l*)
This subsection establishes requirements for communication about lead and its hazards, including those under the provisions of section 5194 (Hazard Communication), as well as for other required training.

Subsection (*l*)(1)(A)
These proposals would add to subsection (*l*)(1)(A) the requirement that in addressing the hazards of lead under section 5194, cardiovascular health effects are to be included. Cardiovascular health effects would be added as subsection (*l*)(1)(A)1.

This addition is necessary as it is now known that cardiovascular effects, including hypertension, are one of the health effects that can develop from exposure to even low levels of lead.

The health effects numbered subsections (*l*)(1)(A)1. – 5. in the existing standard would be redesignated as subsections (*l*)(1)(A)2. – 6.

Subsection (*l*)(1)(B)
These proposals would reformat subsection (*l*)(1)(B) and add three new subsections, (*l*)(1)(B)1., 2. and 3. Existing training requirements would be moved into subsections (*l*)(1)(B)1. – 2.

Subsection (*l*)(1)(B)3.
This subsection would require, as interim protection, training for employees who conduct trigger tasks.

This addition is necessary so that employees, whose exposure is presumed to be above the PEL, and therefore above the action level threshold designated in subsection (*l*)(1)(B)1., but not yet determined through an employee exposure assessment, receive training about the hazards of working with and being exposed to lead.

Subsection (*l*)(1)(C)
A new requirement would be added under subsection (*l*)(1)(C) requiring employers to ensure that training and training materials are appropriate to the educational level, literacy level and language of employees.

This addition is necessary for added protection to employees by ensuring they understand the information in the training that is provided to them, and is consistent with language used in other sections, including section 5199. Aerosol Transmissible Diseases.

In addition, a requirement in subsection (*l*)(1)(C) requiring employers to provide training prior to the time of job assignment would be moved to subsection (*l*)(1)(D).

Subsection (*l*)(1)(D)
Language would be added to clarify which employees the training requirements would apply to, as well as the required content of the training. Also, existing language requiring training to be provided at least annually would be rephrased.

These changes are necessary for greater clarity, and to reflect the addition proposed in subsection (*l*)(1)(B)3., described above.

Subsection (*l*)(1)(E)
A reference to the California Department of Health Services would be changed to the California Department of Public Health.

This change is necessary as the name for that department has changed.

Subsection (*l*)(2)
This subsection specifies the topics that must be covered in a lead training program. A number of topics would be added to the training requirements given in subsection (*l*)(2).

The addition of training topics is necessary to ensure employees receive information on the hazards of lead that reflects current evidence about its effect on health, the routes of exposure and the means of protection. This additional information will enable employees to better understand the importance of minimizing their exposure to lead in order to protect their health.

Subsection (*l*)(2)
These proposals would modify the requirements of subsection (*l*)(2) by adding language to require effective training. This addition is necessary to provide added protection to employees by ensuring that training provided to them fulfills its purpose. Also, a reference would be added to subsection (*l*)(1)(B).

This addition is necessary to clarify that subsection (*l*)(1)(B) specifies which employees are covered by the training requirements.

Subsection (*l*)(2)(B)
The words "at or" would be inserted before "above the action level."

This change is required to correctly reflect the threshold for the relevant requirements of this section, i.e. exposures at or above the action level.

Current subsection (*l*)(2)(C) would be redesignated as subsection (*l*)(2)(D) and current subsection (*l*)(2)(D) would be redesignated as subsection (*l*)(2)(E) and (F).

Subsection (*l*)(2)(C)
New language would be added, to require that training includes information on the importance of effective hygiene practices, and how to remove lead contamination from skin with the use of special cleansing compounds, in accordance with section 1527(a)(2).

These additions are necessary because proper hygiene is required to prevent significant exposures to lead that can occur through ingestion via lead contamination on the hands and skin. Training on the use of special cleansing compounds is necessary because under section 1527(a)(2), employers are required to provide these compounds, where necessary for lead removal from skin surfaces.

Current subsections (*l*)(2)(E) – (H) would be redesignated as subsections (*l*)(2)(L) – (O), respectively.

Subsection (*l*)(2)(F)
Information on the cardiovascular health effects of exposure to lead, as well as information on low-level chronic exposure to lead, would be added to the required training topics currently found in subsection (*l*)(2)(D). Also, a reference to "excessive" exposure to lead would be removed.

These additions are necessary to ensure that employees receive important information on health effects, including cardiovascular effects, which can occur at even low levels of lead exposure.

S**ubsection (*l*)(2)(G)**
New language would be added to expand on the requirements currently found in subsection (*l*)(2)(D) about adverse reproductive effects and require that training on damage to both male and female reproductive health includes information that this health damage can be caused by low-level lead exposure, including damage associated with BLLs under 5 µg/dl.

This addition is necessary to ensure that employees receive important information that reproductive health effects can occur at even low levels of lead exposure.

Subsection (*l*)(2)(H)
New language would be added, to require that training includes information on the employer's duty to provide medical examinations and consultations, as required by subsection (j)(3)(A), upon request to specified employees who desire medical advice about their ability to procreate a healthy child.

This addition is necessary to ensure employees receive information on their rights to medical examinations and consultations when they notify their employer that they desire medical advice concerning their ability to have a healthy child. Providing this information to employees could result in more employees with lead exposure having examinations and consultations, thus preventing adverse reproductive health outcomes.

Subsection (*l*)(2)(I)
New language would be added, to require that training includes information on the routes of exposure to lead.

This addition is necessary to ensure that employees are informed that lead exposure can result from lead in the air they breathe, as well as from lead that they ingest from contaminated hands or other surfaces. Better informed employees will be more likely to use required respiratory protection, and follow hygiene procedures, such as hand washing, thus limiting their exposure to lead.

Subsection (*l*)(2)(J)
New language would be added, to require that training includes information on the harm to household members that can be caused by lead contamination on an employee's clothing, shoes and body, as well as in their vehicles.

These additions are necessary to ensure that employees are informed that lead can be transported on their contaminated clothes, shoes and body, and cause harm to their household members, especially to young children and pregnant women. Better informed employees will be more likely to follow proper procedures regarding contaminated personal protection equipment (PPE) and clothing, and hygiene, including showering. Exposure to lead would be reduced, both for the employee and their household members.

Subsection (*l*)(2)(K)
New language would be added, to require that training includes the recommendation to shower to minimize take-home lead exposure. In addition, a note would be added, clarifying the conditions under which an employer must provide shower facilities and ensure their use.

These additions are necessary to ensure employees are informed that showering immediately upon returning home from work is recommended. Better informed employees will be more likely to shower, thus reducing lead exposure to employees and their household members.

Subsections (*l*)(2)(L), (*l*)(2)(N) and (*l*)(2)(O)
Minor wording changes would be made. These changes are necessary to increase clarity of the existing requirements.

Subsection (*l*)(3)
These proposals would replace the term "the permissible exposure limit" with "50 µg/m^3 as an 8-hour TWA."

This change is necessary so the proposed training and certification requirements would remain consistent with the current requirements. According to the Public Agency Safety Management Association (PASMA), requiring CDPH-accredited training and certification for employees exposed to lead at or above 10 µg/m^3 would result in significant training costs for local government entities. PASMA estimated that there are approximately 8,100 local government workers who may be engaged in lead-related construction work. The total estimated cost to provide each of these workers with CDPH Lead Worker training would be in excess of $19,000,000 (PASMA, 2016). As the current permissible exposure limit (PEL) is 50 µg/m^3 as an 8-hour TWA, replacing "the permissible exposure limit" with "50 µg/m^3 as an 8-hour TWA" would result in no change in the application of the subsection (*l*)(3) training requirements.

Subsection (*l*)(3)
A reference to the California Department of Health Services would be changed to the California Department of Public Health (CDPH).

This change is necessary as the name for this department has changed.

<u>Subsection (m) Signs.</u>

Subsection (m)
This subsection establishes requirements for signs.

Subsection (m)(1)(A)
This subsection would be modified such that the requirement that employers post warning signs about the danger of lead in work areas where the PEL is exceeded would be changed to work areas where exposures are at or above the action level.

This change is necessary to support the overall goal of maintaining employee BLLs below 10 µg/dl. Significant exposure to airborne lead can occur when airborne levels are at or above the action level. In addition, these areas could have significant levels of lead contamination on surfaces. Surface contamination can result in occupational exposure to lead, through ingestion.

Subsection (m)(1)(E)
This subsection would be removed. This change is necessary as its requirements only applied prior to June 1, 2016.

Subsection (n) Recordkeeping.

Subsection (n)
This subsection establishes requirements for recordkeeping.

Subsection (n)(1)(B)4.
These proposals would modify the language in subsection (n)(1)(B)4. to require a unique identifier (such as date of birth or employee identification number) to be used in lieu of a SSN to identify employees in records of exposure monitoring.

This change is necessary to comply with a Cal/OSHA directive to remove all requirements in its standards to include employee SSNs on exposure monitoring, medical surveillance, or other records, in order to facilitate employers' efforts to safeguard employee privacy. This directive is in response to Federal OSHA's Standards Improvement Project proposal to remove requirements for including employee SSNs in its regulations.

Subsection (n)(1)(B)5.
This subsection would be modified, to require that information be recorded about the work operations conducted by individuals who are monitored and the conditions prevailing in employers' operations.

This change is necessary to ensure that sufficient information is recorded to demonstrate the applicability of exposure data to satisfy the requirements of subsections (d)(3), (d)(4), (d)(5) and (d)(6).

The language in existing subsection (n)(2) would be redesignated as subsection (n)(3).

Subsection (n)(2)
A new heading, "Written compliance program review," would be added. In addition, new language would be added to this subsection, to require that records of revisions and updates to the employer's written compliance program be retained for three years.

These additions are necessary to ensure that records of revisions and updates to written compliance programs, required by subsection (e)(2)(E), are retained and thus available to serve as documentation of the status of the employer's lead compliance program as it evolves over time. Access to these records by Cal/OSHA enforcement personnel would be necessary when conducting investigations. Requiring three years of records to be kept reflects a balance between enforcement's needs and the burden on employers for recordkeeping.

Subsection (n)(3)(B)1.
These proposals would modify the language in redesignated subsection (n)(3)(B)1. to require a unique identifier (such as date of birth or employee identification number) to be used in lieu of a SSN to identify employees in records of medical surveillance.

This change is necessary to comply with a Cal/OSHA directive regarding SSNs (see subsection (n)(1)(B)4. above).

Subsection (n)(3)(C)3.
The phrase "biological monitoring" would be replaced with "blood lead testing."

This change is necessary as the requirement to conduct routine ZPP testing would be removed and thus "blood lead testing" more accurately describes the record which must be kept pursuant to this subsection.

Subsection (n)(4)
These proposals would replace existing language with entirely new language in **subsection (n)(4)**. It would be given the new heading "Written elevated blood lead level response plans." The new language in this subsection would require that these plans, required under subsection (j)(2)(E), be retained for three years.

This addition is necessary to ensure that written elevated BLL response plans are retained. The plans would then be available for review, so that implementation of the means of reducing and maintaining an employee's blood lead level below 10 µg/dl could be evaluated over time. Access to these records by Cal/OSHA enforcement personnel would be necessary when conducting investigations. Requiring three years of records to be kept reflects a balance between enforcement's needs and the burden on employers for recordkeeping.

Subsection (n)(5)
This subsection incorporates the language in existing subsection (n)(3).

Subsection (n)(5)(B)1.
In addition, these proposals would modify the language in proposed subsection (n)(5)(B)1. to require a unique identifier (such as date of birth or employee identification number) to be used in lieu of an SSN to identify employees in records of medical removals.

This change is necessary to comply with a Cal/OSHA directive regarding SSNs (see subsection (n)(1)(B)4. above).

Subsection (n)(6)
These proposals would add language in proposed subsection (n)(6), and add a new heading, "Training." New language in this subsection would specify the information required in training records, and require that the records be maintained for three years.

This addition is necessary to demonstrate that employees have received the initial, annual, or supplemental training (provided in accordance with subsection (j)(2)(E)) required by this section.

These proposals would redesignate subsections (n)(4), (n)(5) and (n)(6) as subsections (n)(7), (n)(8) and (n)(9), respectively.

Nonsubstantive and Editorial Changes

In addition, these proposals would make nonsubstantive and editorial changes to wording in section 1532.1 to provide greater clarity for employers and also to provide consistency in language amongst the subsections of this regulation.

Appendices

There are four appendices to section 1532.1: A, B, C and D. Per section 1532.1(q) Appendices: "The information contained in the appendices to this section is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation."

These proposals would make numerous changes to the appendices. A brief description of these changes is given below. Because the appendices are purely informational, and do not by themselves create any additional obligations not otherwise imposed by section 1532.1 nor detract from any existing obligation, individual changes proposed for the appendices, and the problem/purpose/necessity for each, are not included in this Initial Statement of Reasons.

Appendix A

These proposals would modify the language in Appendix A – Substance Data Sheet for Occupational Exposure to Lead to reflect current knowledge about the adverse health effects of exposure to lead, as well as changes that are proposed for section 1532.1.

Appendix B

These proposals would modify the language in Appendix B –Employee Standard Summary to reflect changes that are proposed for section 1532.1, as well as to reflect current information about the most common chelating agents.

Appendix C

These proposals would modify the language in Appendix C – Medical Surveillance Requirements to reflect current information about the medical evaluation and treatment of exposure to lead, as well as changes that are proposed for section 1532.1.

Appendix D

These proposals would remove Appendix D - Qualitative and Quantitative Fit Test Protocols from the regulation.

This change is necessary as the History notes for section 1532.1 indicate that an amendment repealing appendix D and adding an editorial reference was filed 8-25-98; operative 11-23-98 (Register 98, No. 35).

Section 5155. Airborne Contaminants.

The proposed amendments would revise the requirements of section 5155 by lowering, in its Table AC-1, the PEL for "lead chromate, as Pb," from 0.02 mg/m^3 to 0.01 mg/m^3.

This change is necessary to provide greater health protection for employees who work with lead, and to bring the value listed in section 5155, Table AC-1 in line with the lower PEL for lead proposed for sections 1532.1 and 5198. An airborne concentration of 0.01 mg/m^3 is equivalent to 10 µg/m^3.

In addition, the proposed amendments would revise the requirements of section 5155 by lowering, in Table AC-1, the PEL for lead (metallic) and inorganic compounds, dust and fume, as Pb, from 0.05 mg/m^3 to 0.01 mg/m^3.

This change is necessary to provide greater health protection for employees who work with lead, and to bring the value listed in section 5155, Table AC-1 in line with the lower PEL for lead proposed for sections 1532.1 and 5198. An airborne concentration of 0.01 mg/m^3 is equivalent to 10 µg/m^3.

The proposed amendments would also add to Table AC-1 the Chemical Abstracts Service (CAS) Number, 7439921, for Lead (metallic) and inorganic compounds, dust and fume, as Pb.

This addition is necessary to clearly identify lead as a specific substance. The CAS Number for lead appears to have been omitted from Table AC-1 in error.

In addition, a reference to section 1532.1 would be added after the phrase "see also section 5198."

This change is necessary to clarify that this PEL also applies to section 1532.1.

Section 5198. Lead.

Subsection (b) Definitions.

Subsection (b)
This subsection defines terms used throughout the regulation.

Action level. These proposals would modify the definition of action level, by lowering the action level from 30 μg/m^3 to 2 μg/m^3.

As the action level is used in the regulation to trigger certain employee protections, this reduction in the action level is necessary to provide greater protection to employees who work in areas with airborne lead concentrations of 2 μg/m^3 or greater as an 8-hour TWA. This is in service of the overall goal of maintaining employee BLLs below 10 μg/dl.

These proposals would replace the phrase "at an 8-hour time-weighted average concentration" with "calculated as an 8-hour time-weighted average (TWA)."

This change is necessary to provide consistency with both the existing definition of action level in section 1532.1, and with the proposed changes in the definition of the permissible exposure limit in subsection 5198(c).

Chief. These proposals would modify the current definition of Chief, by removing the mailing address, and adding "or designee."

This change in definition is necessary to match the current definition in section 1532.1, and to allow for a more flexible definition.

The following new definitions are proposed for section 5198. They are necessary to establish the exact meanings for the terms as used within the context of the requirements of section 5198. They are necessary to clarify that the terms, as used, may have more specific meanings

for the protection of employees from occupational exposure to lead than they would in general usage.

Altering or disturbing is defined to identify activities that may result in the release of lead dust, lead mist, lead fume, or other lead particles. The definition provides employers with specific examples of activities that are "altering or disturbing."

This definition is necessary to establish the type of activities employees perform that are included in the definition of "presumed hazardous lead work," which is defined below. This definition is also necessary to establish the type of activities that are referred to in subsection (k) Medical Removal Protection.

Blood lead level is defined to mean and identify the concentration of lead measured in whole blood, expressed as micrograms per deciliter (µg/dl) of whole blood.

This definition is necessary to ensure that employers provide appropriate testing of the blood of employees when required by the regulation.

High-efficiency particulate air (HEPA) filter is defined to clarify the meaning of the acronym HEPA, and to state the physical properties of a HEPA filter.

This definition is necessary as the acronym HEPA is used in the existing language of the regulation in several subsections but is not defined.

Presumed hazardous lead work (PHLW) is defined to specify work activities that trigger various employee protections provided by the regulation. PHLW includes altering or disturbing material that is known or reasonably anticipated to contain lead at a concentration of 0.5% weight or greater, and torch cutting any scrap metal.

This definition is necessary as the term (shown as the abbreviation PHLW) is used in changes proposed throughout the regulation. The inclusion of torch cutting any scrap metal is necessary in the definition because torch cutting is often used to reduce the size of large-sized structural steel scrap that can contain coatings containing lead at 0.5% by weight or greater. It is often the case that these coatings are untested and the presence of lead unidentified. Torch cutting these materials can result in high levels of lead fume as the coating is volatized. In this way, unprotected workers can be unknowingly exposed to very high levels of lead.

These proposals would set a threshold to the amount of specified activities that would meet the definition of PHLW. Conducting these activities for less than a total of eight hours during any 30-day period would not constitute PHLW, as defined.

This is necessary to ensure that an overly broad definition of PHLW does not trigger regulatory requirements which are not proportionate to lower levels of exposure.

These proposals would use a formal exception to specify when altering or disturbing material that is known or reasonably anticipated to contain lead at a concentration of 0.5% weight or greater, or torch cutting any scrap metal, would not constitute PHLW when conducting these activities for less than a total of eight hours during any 30-day period.

This is necessary to make clear that, if the exception is claimed, it is the employer's duty to ensure and be able to demonstrate that the conditions of the exception are met.

Subsection (c) Permissible Exposure Limit (PEL).

Subsection (c)
This subsection establishes the PEL for lead, the maximum airborne concentration of lead, calculated as an 8-hour TWA, to which employees may be exposed during a work day. When respirators are used to supplement engineering and work practice controls to comply with the PEL, employee exposure, for the purpose of determining whether the employer has complied with the PEL, may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily 8-hour TWA exposure.

Subsection (c)(1)
This subsection establishes the PEL for lead. These proposals would lower the PEL for lead from 50 µg/m^3 to 10 µg/m^3.

This change is necessary to ensure that employees are protected from airborne exposures to lead that could cause disease or other adverse health effects. The lower PEL is in service of the goal of maintaining employee BLLs below 10 µg/dl.

These proposals would replace the phrase "at an 8-hour time-weighted average concentration" with "an airborne concentration...calculated as an 8-hour time-weighted average (TWA)." In addition, the following sentence would be added in subsection (c)(1): "The 8-hour TWA shall be calculated in accordance with the appendix to section 5155." These changes are necessary to provide consistency with the language used in section 5155 (Airborne Contaminants) as well as all other Cal/OSHA substance-specific standards.

Subsection (c)(2)
Existing subsection (c)(2) provides a formula to calculate an allowable exposure level when an employee is exposed to lead for more than 8 hours in any work day. These proposals would remove the formula and accompanying language from this subsection.

This change is without regulatory effect and is necessary because calculating the allowable exposure in this way is confusing and departs from the way exposures greater than 8 hours are regulated by Cal/OSHA in all other substance specific regulations, as well as in section 5155 (Airborne Contaminants) and its appendix.

The language currently found in subsection (c)(3) would be redesignated as **subsection (c)(2)**.

In proposed subsection (c)(2), the phrase "and all requirements of subsections (e)(1) and (f) have been met" would be added.

This addition is necessary for consistency with the requirements currently given in redesignated section 1532.1(c)(2). The addition of the phrase provides greater health protection for employees, as the use of respirators to reduce employee exposure to lead would be subject to meeting all the requirements for engineering and work practice controls in subsection (e)(1), along with all the requirements for respiratory protection in subsection (f).

Subsection (d) Exposure Monitoring.

Subsection (d)
This subsection establishes requirements for the collection of personal air samples to determine employee exposure to airborne lead.

Subsection (d)(1)
This subsection specifies the type of air samples that must be collected to determine employee exposure to lead. These proposals would remove the time requirement of "at least 7 continuous hours."

This change is necessary to clarify that samples must be collected for a full shift, as opposed to a certain number of hours.

These proposals would redesignate existing subsections (d)(2), (d)(3), (d)(4), (d)(5), (d)(6), (d)(7), (d)(8) and (d)(9) as subsections (d)(3), (d)(4), (d)(5), (d)(6), (d)(7), (d)(8), (d)(9) and (d)(10), respectively.

Subsection (d)(2)
This subsection would establish new language under the heading "Protection of Employees Prior to Assessment of Exposure." These proposals would specify that employers would be required to provide a number of interim protections to employees performing PHLW, as defined in subsection (b), until the employer performs an exposure assessment.

These changes are necessary to provide essential protections to exposed employees until the employer has assessed actual employee exposures.

Subsection (d)(2)(A)
This subsection would require that these interim protections include the use of appropriate respiratory protection, being at least a half-mask respirator. However, it would not allow the use of filtering facepiece respirators. An explanatory note would be added pointing out that a respirator providing more protection than a half-mask may be necessary for employees performing high exposure tasks.

This change is necessary to provide greater health protection to exposed employees, where an exposure assessment has not been conducted, by requiring a minimum level of respiratory protection. Filtering facepiece respirators would not be allowed because they are unlikely to provide adequate protection to employees, due to the difficulty in achieving and maintaining a satisfactory seal on the employee's face. The explanatory note is intended to alert the employer to the fact that a half-mask respirator may not be adequate to protect employees conducting certain high exposure tasks.

Subsection (d)(2)(B)
This subsection would require that these interim protections include the provision of protective work clothing and equipment, in a clean and dry condition, at least weekly in accordance with subsection (g).

This change is necessary to provide greater health protection to exposed employees, where an exposure assessment has not been conducted, by providing a minimum level of protection against lead contamination of body and clothing.

Subsection (d)(2)(C)
This subsection would require that these interim protections include the provision of medical surveillance in accordance with subsection (j).

This change is necessary to provide greater health protection to exposed employees, where an exposure assessment has not been conducted, by providing blood lead testing, and in some cases, medical exams and consultations. This will help ensure that an employee's lead exposure and health are assessed, and that the efficacy of the other interim protections is evaluated.

Subsection (d)(2)(D)
This subsection would require that these interim protections include training in accordance with subsection (*l*) required for employees exposed at or above the action level.

This change is needed to provide greater health protection to exposed employees, where an exposure assessment has not been conducted, by providing them with comprehensive

information about lead, how to prevent exposure, their rights under the standard and the importance of medical surveillance.

Subsection (d)(2)(E)
This subsection would require that these interim protections include the requirement that employers post signs, in accordance with subsection (m)(2), in areas where employees perform PHLW.

This change is needed to provide greater health protection to exposed employees, where an exposure assessment has not been conducted, by communicating to them the hazards of lead and basic hygiene precautions.

Subsection (d)(6)
This subsection requires that the employer make a written record when a determination is made that no employee is exposed to concentrations of airborne lead at or above the action level. These proposals would require a unique identifier (such as date of birth or employee identification number) to be used in place of an SSN in written records for each employee monitored.

This change is necessary to comply with a Cal/OSHA directive to remove all requirements in its standards to include employee SSNs on exposure monitoring, medical surveillance, or other records, in order to facilitate employers' efforts to safeguard employee privacy. This directive is in response to Federal OSHA's Standards Improvement Project proposal to remove requirements for including employee SSNs in its regulations.

Subsection (d)(7)
This subsection specifies the frequency with which air monitoring must be performed to determine employee exposure to airborne lead. These proposals would not change the currently specified (every months) monitoring frequency for exposure levels of 30 µg/m^3 as an 8-hour TWA (the current action level) and the current (every 3 months) monitoring frequency for exposure levels above 50 µg/m^3 as an 8-hour TWA (the current PEL). However, current references to "the PEL" would be replaced by "50 µg/m^3 as an 8-hour TWA," and current references to "the action level" would be replaced by "30 µg/m^3 as an 8-hour TWA." These proposals would also newly require monitoring every 12 months at the proposed action level (2 µg/m^3 as an 8-hour TWA).

These changes are necessary to respond to the lower proposed action level, while also offering employers relief in the area of air monitoring frequency. By maintaining the required frequencies at the air concentrations associated with the current action level and the current PEL, the proposed language is not less protective than the current federal language.

These proposals would modify the language of proposed subsections (d)(7)(A) and (B), add new requirements in proposed subsection (d)(7)(C), and redesignate existing subsection (d)(6)(C) to subsection (d)(7)(D).

Subsections (d)(7)(A) and (d)(7)(B)
References to "the permissible exposure limit" in these subsections would be replaced by "50 µg/m^3 as an 8-hour TWA," and in proposed subsection (d)(7)(B), references to "the action level" would be replaced by "30 µg/m^3 as an 8-hour TWA."

These changes are necessary to correctly notify employers of the monitoring requirements at specified exposure levels, given that these proposals would change the meaning of the terms "permissible exposure limit" and "action level."

Subsections (d)(7)(A), (d)(7)(B) and (d)(7)(D)
The language would be amended to change references to "an employee's exposure" to "employee exposure." Similarly, in proposed subsection (d)(7)(A), the phrase "for that employee" would be removed.

These changes are necessary for consistency with the existing language used in section 1532.1(d)(6). The changes are also appropriate, as the purpose of monitoring is to determine employee exposure, where "employee" could refer to a group of employees rather than to a particular employee's exposure.

Subsection (d)(7)(A)
These proposals would remove the word "initial" from the term "initial monitoring," to require quarterly monitoring, based not only on the results of initial monitoring, as stated in the existing regulation, but also on the results of any subsequent monitoring.

This change is necessary to require repeat monitoring quarterly when an employee's exposure is above 50 µg/m^3, regardless of whether this was determined through initial or subsequent monitoring.

Subsection (d)(7)(A)
Requirements for subsequent monitoring would be modified, in that it would be required at the frequency specified in subsection (d)(7)(B) or (C), as appropriate, based on the monitoring results.

This change is necessary to reflect the new monitoring requirements proposed for subsection (d)(7)(C).

Subsection (d)(7)(B)
Language referring to "initial" monitoring or "monitoring conducted in accordance with subsection (d)(6)(A)" would be removed.

This change is necessary to require repeat monitoring every 6 months when an employee's exposure is at or above 30 µg/m^3, but no greater than 50 µg/m^3, regardless of whether this was determined through initial or subsequent monitoring.

Subsection (d)(7)(B)
Language would be added, stating, "subsequent monitoring shall conform with the applicable provisions of subsection (d)(7)(C)." In addition, a phrase stating that the employer may discontinue monitoring (when the results are below the current action level of 30 µg/m^3) would be removed.

These changes are necessary to reflect the new monitoring requirements proposed for subsection (d)(7)(C).

Subsection (d)(7)(C)
The new subsection would establish requirements when initial or subsequent monitoring shows employee exposure to be at or above the action level but below 30 µg/m^3 as an 8-hour TWA. At this level of exposure, monitoring would be required every 12 months.

This addition is necessary to ensure that at least a minimal amount of repeated air monitoring is conducted when an employee's exposure is at or above the proposed action level of 2 µg/m^3. In addition, this change would encourage employers to strive to reduce employee exposures to below 2 µg/m^3.

Subsection (d)(7)(D)
Existing language would be removed, such that the requirements would apply only to initial monitoring.

This change is necessary for consistency with the existing language used in section 1532.1(d)(6)(A). The change is also appropriate, as the language that would be removed no longer makes sense, given the other changes proposed in subsection (d)(7) as outlined above.

Subsection (d)(10)
This subsection specifies the required accuracy of the method of monitoring and analysis that an employer must use.

These proposals would change the concentration of airborne lead at which this accuracy must be met to equal to or greater than 2 µg/m^3 from the existing 30 µg/m^3.

This change is necessary to ensure accuracy requirements for sampling and analytical methods are met when monitoring for airborne lead at the proposed, lowered action level of 2 $\mu g/m^3$.

Subsection (e) Compliance.

Subsection (e)
This subsection establishes requirements for employers to achieve compliance with the PEL.

Subsection (e)(1)
This subsection establishes requirements for methods of compliance with the PEL.

These proposals would amend language in subsection (e)(1)(A), add a new subsection (e)(1)(B) which establishes new requirements, redesignate and amend the existing language in subsection (e)(1)(B) as subsection (e)(1)(C), and remove the language of existing subsection (e)(1)(C).

Subsection (e)(1)(A)
These proposals would add to subsection (e)(1)(A) a reference to subsection (e)(1)(B).

This addition is necessary, as subsection (e)(1)(B) would allow an exception for specified processes from meeting the requirements of subsection (e)(1)(A).

In addition, the phrase "for more than 30 days per year" would be removed, so as to require an employer to implement specified control measures where any employee is exposed above the PEL, regardless of the number of days.

This change is necessary to provide greater health protection for employees who work with lead for 30 days per year or less. The change would also provide consistency with the requirements given in section 1532.1(e)(1).

Also, language would be amended so as to include administrative controls within work practice controls.

This change is necessary for consistency with other sections, including section 1532.1 and section 5207 (Cadmium).

In addition, the phrase "at or below the PEL" would be added.

This addition is necessary to clarify that the employer must implement controls to reduce and maintain employee exposure to lead at or below the PEL.

Also, language that requires employers to institute controls even when they are not sufficient to reduce employee exposure to or below the PEL would be removed from subsection (e)(1)(A) and placed under proposed subsection (e)(1)(C).

This change is necessary to address the controls required by subsections (e)(1)(B) and (C).

Additionally, language would be removed which requires small non-ferrous foundries to achieve an airborne level of 75 µg/m^3, rather than the PEL, using specified control measures.

This change is needed to provide added health protection for employees working in small non-ferrous foundries.

Subsection (e)(1)(B)
These proposals would add new language in proposed subsection (e)(1)(B), followed by a new table, Table 1. Separate engineering control air limits (SECALs) would be specified for particular processes. Where a SECAL is specified, the employer would be required to implement engineering and work practice controls to reduce and maintain employee exposure to lead at or below the SECAL, except to the extent that the employer can demonstrate that such controls are not feasible. Employers would be required to protect employees from exposures above the PEL by any mix of compliance methods, including engineering and work practice controls, and respiratory protection. There is a precedent for the establishment of SECALs, in both the Federal OSHA and Cal/OSHA standards for cadmium (29 CFR 1910.1027 and title 8 CCR section 5207, respectively). Table 1 would establish SECALs for selected processes, which are all within the lead acid battery manufacturing industry, along with implementation dates. For oxide production, paste mixing, grid pasting and parting and battery assembly, the SECAL would be 50 µg/m^3 at the effective date of the standard, then 40 µg/m^3 at five years from the effective date of the standard. For grid production and small parts casting, and plate formation, the SECAL would be 50 µg/m^3 at the effective date of the standard, then 30 µg/m^3 at five years from the effective date of the standard. In addition, these proposals would include an asterisk in Table 1 to clarify that processes that are not specified in the table must achieve the PEL as specified in subsection (e)(1)(A). A second asterisk to Table 1 would clarify that a SECAL is an airborne concentration of lead calculated as an 8-hour TWA.

The establishment of SECALs for these processes is necessary because the lead acid battery manufacturing industry demonstrated that for certain processes, it would be unable to comply with the proposed PEL using only feasible engineering and work practice controls. The Battery Council International (BCI) provided Cal/OSHA with confidential business information that estimated the industry-wide annualized compliance costs of implementing the proposed PEL for the areas where SECALs are proposed would represent 45.2% of the most recently reported annual profits if SECALs were not adopted (BCI, 2015). Furthermore, the 5 year phase-in period for more stringent SECALs would allow the lead acid battery manufacturing industry time to institute more effective engineering and work practice controls in its facilities (Pedroza, 2015).

Subsection (e)(1)(C)
Language would be added in proposed subsection (e)(1)(C) to specify that where engineering and work practice controls are not sufficient to achieve the PEL or where applicable, the SECAL, the employer must implement such controls to reduce exposures to the lowest levels feasible.

This change is necessary to clarify that employers must reduce exposure to the lowest level feasible using engineering and work practice controls and may only use respiratory protection to achieve the PEL as a supplement to these controls. This provides additional health protection for employees, as engineering and work practice controls provide more consistent employee protection than respiratory protection.

Existing subsection (e)(1)(C), which applies to situations where an employee is exposed above the PEL for 30 days or less per year, would be removed.

This change is necessary to provide added health protection to employees who are exposed above the PEL for 30 days or less per year. The change would also provide consistency with the requirements given in section 1532.1(e)(1).

Subsection (e)(2)
This subsection establishes requirements for a lead compliance program.

Subsection (e)(2)(A)
These proposals would remove from subsection (e)(2)(A) the words “where applicable” and add a reference to SECALs.

These changes are necessary for clarity, as the requirements for a written compliance program apply to all employers who must reduce exposures to comply with the PEL or SECAL.

A reference to subsection (e)(1)(C) would also be added.

This is necessary to include a provision for feasibility regarding engineering and work practice controls.

A reference in subsection (e)(2)(A) to an implementation schedule in subsection (e)(1) would be removed.

This change is necessary, as the current regulation has no implementation schedule in subsection (e)(1). This appears to be a reference to an implementation schedule in Federal OSHA regulation 1910.1025, dating back to 1996, which is no longer applicable.

Subsection (e)(2)(B)3.
These proposals would modify the language in subsection (e)(2)(B)3. to amend its requirements by adding that the written compliance program shall include a report of any engineering and

work practice controls that were considered by the employer but not implemented due to infeasibility, and how these controls were determined to be infeasible.

This amendment is necessary to ensure that employers document the rationale behind their determination that certain control measures would not be feasible.

Also in subsection (e)(2)(B)3., the word "any" would be added before "engineering and work practice controls."

This change is necessary because in some cases there would not be any engineering and work practice controls that were considered in the context of subsection (e)(2)(B)3.

Subsection (e)(3)
These proposals would remove existing subsection (e)(3) [Reserved], and redesignate existing subsection (e)(4) as subsection (e)(3). Subsection (e)(5) would be redesignated as subsection (e)(4).

These changes are necessary, as existing subsection (e)(3) [Reserved] contains no text.

Subsections (e)(2)(D) and (e)(4)
Language would be added to require written documentation. In subsection (e)(2)(D), written documentation of revisions and updates to the compliance program would be required in accordance with subsection (n)(2). In proposed subsection (e)(4), written documentation of any job rotation schedule would be required.

These changes are necessary to ensure these revisions, updates and schedules are made in a formalized manner that can be reviewed at a future time.

Subsection (e)(4)(A)
These proposals would add language to subsection (e)(4)(A) to require that an employee's name and another unique identifier be used when job rotation schedules are established and implemented.

This change is necessary for consistency with language proposed for recording requirements proposed for subsection (d)(6) and elsewhere in the regulation.

Subsection (f) Respiratory Protection.

Subsection (f)
This subsection establishes requirements for respiratory protection when employees are required by this section to use respirators.

Subsection (f)(1)(A)
The phrase "permissible exposure limit" would be replaced with the acronym "PEL." This change is necessary for consistency, as the acronym "PEL" is used throughout the regulation.

Subsection (f)(1)(D)
These proposals would add a new subsection (f)(1)(D), containing language requiring that respirators be provided and used, as interim protection for an employee when they perform PHLW.

This addition is necessary to provide greater health protection to exposed employees, where an exposure assessment has not been conducted, by requiring a minimum level of respiratory protection, in accordance with subsection (d)(2).

Subsection (f)(2)(A)
These proposals would change the language of subsection (f)(2)(A) to replace a reference to section 5144(c) with section 5144(b).

This change is necessary to include in the requirements for respiratory protection provisions that are given in the definitions found in section 5144(b).

Subsection (f)(3)(A)
A requirement would be added that would prohibit employers from selecting or using filtering facepiece respirators to protect their employees when respirator use is required.

This amendment is necessary, because filtering facepiece respirators are unlikely to provide adequate protection to employees, due to the difficulty in achieving and maintaining a satisfactory seal on the employee's face.

Subsection (f)(3)(D)
These proposals would add specifications for the type of filters that an employer would be required to provide for non-powered air-purifying respirators, and modify text to clarify that HEPA filters are to be provided for powered air-purifying respirators. These changes are necessary to reflect NIOSH rules for respirators that were updated in 1995.

Subsection (g) Protective Work Clothing and Equipment.

Subsection (g)
This subsection establishes requirements for protective work clothing and equipment.

Subsection (g)(1)
This subsection establishes requirements for the provision and use of protective work clothing and equipment.

Subsections (g)(1)(C)1., (g)(1)(C)2. and (g)(1)(C)3.
These proposals would redesignate existing subsections (g)(1)(A), (g)(1)(B) and (g)(1)(C) as subsections (g)(1)(C)1., (g)(1)(C)2. and (g)(1)(C)3.

Subsections (g)(1)(A), (g)(1)(B) and (g)(1)(C)
These proposals would amend the language of subsection (g)(1) by moving existing requirements in subsection (g)(1) into proposed subsections (g)(1)(A), (g)(1)(B) and (g)(1)(C)**.** Non-substantive changes were made to the language in these subsections to improve clarity.

Subsection (g)(1)(A)
A reference to Article 10 would be moved from its current location in subsection (g)(1)(C) to proposed subsection (g)(1)(A).

This change is necessary to ensure that all protective clothing and equipment is selected and used in accordance with Article 10 requirements for personal safety devices and safeguards.

Subsection (g)(1)(A)2.
Language would be added in subsection (g)(1)(A)2. requiring that appropriate protective work clothing and equipment be provided, as interim protection to employees who perform PHLW.

This addition is necessary to provide greater health protection to exposed employees, where an exposure assessment has not been conducted, by providing a minimum level of protection against lead contamination of body and clothing, in accordance with proposed subsection (d)(2).

Subsection (g)(2)(A)
These proposals would modify the exposure level at which an employer would be required to provide, at least daily, clean and dry protective clothing to employees, from 150 µg/m^3 to 30 µg/m^3.

This change is necessary to reflect the lower proposed PEL of 10 µg/m^3, and to support the overall goal of reducing and maintaining employees' BLLs below 10 µg/dl.

Subsection (g)(2)(G)2.
This subsection would be removed. This change is necessary as the requirements of subsection (g)(2)(G)2. no longer apply.

<u>Subsection (h) Housekeeping.</u>

Subsection (h)
This subsection establishes requirements for cleaning floors and other surfaces.

Subsection (h)(2)
These proposals would change the heading of subsection (h)(2) from "Cleaning Floors" to "Cleaning Methods."

This change is necessary as the requirements of subsection (h)(2) apply to floors and surfaces other than floors.

Subsection (h)(2)(A)
The word "may" would be replaced with "shall." This change has no regulatory effect but makes clear that use of compressed air to clean floors and surfaces of lead is prohibited.

Subsection (h)(2)(B)
This new subsection would be added, which requires, wherever possible, floors and other surfaces to be cleaned of lead by vacuuming or other methods that minimize the likelihood that lead will become airborne.

This change is necessary to notify employers that cleaning, wherever possible, must be done using methods that are not likely to cause lead to become airborne. This proposed language is also consistent with existing language in section 1532.1(h)(2).

Subsection (h)(2)(C)
Existing subsection (h)(2)(B) would be redesignated as subsection (h)(2)(C), and language there would be amended to require an employer to demonstrate that vacuuming or other equally effective methods have been tried and found not to be effective, before they would be permitted to clean using shoveling, dry or wet sweeping or brushing.

This amendment is necessary to place the burden of proof on an employer to demonstrate that these cleaning methods, normally considered safe and effective, have been tried and found not to be effective, before they would be permitted to clean using methods which are considered less safe, such as shoveling, dry or wet sweeping or brushing.

Subsection (h)(3)
The term "HEPA filter" would be used, while the term "high efficiency particulate air filter" and its definition would be removed.

These changes are necessary, as the term and its definition have been moved to subsection (b).

Subsection (i) Hygiene Facilities and Practices.

Subsection (i)
This subsection establishes requirements for hygiene facilities and practices.

Subsection (i)(1)
These proposals would expand subsection (i)(1). In addition, a heading, "General Hygiene" would be added. This amendment is necessary to indicate that the requirements of subsection (i)(1) are general in nature.

These proposals would add subsections (i)(1)(A), (B), (C) and (D).

Subsection (i)(1)(A)
In proposed subsection (i)(1)(A), the existing requirements for employers to prohibit food, beverages, tobacco products and cosmetics would be expanded to include all areas where employees are exposed to lead, rather than only to areas where the PEL is exceeded.

This change is necessary to provide greater health protection to employees from the hazard of lead ingestion, which may occur in areas where the hands of employees can become contaminated with lead, even when airborne levels of lead are below the PEL.

Subsection (i)(1)(B)
This new subsection would include language currently found in subsection (i)(5). This change is necessary as requirements for lavatories are most appropriately placed under General Hygiene in subsection (i)(1).

Subsection (i)(1)(C)
New language would require employers to make special cleansing compounds available, where necessary to remove lead from employees' skin.

This addition is necessary, as simple soap and water may not be adequate to remove lead from employees' skin. Lead contamination on the skin of employees increases the possibility of lead ingestion. Existing language in section 1527 of the Construction Safety Orders has a similar requirement for the provision of special compounds when necessary to remove hazardous substances from the skin.

Subsection (i)(1)(D)
This new subsection would include a requirement, currently found in subsection (i)(4)(C), that employers ensure that employees wash before eating, drinking, smoking or applying cosmetics. In subsection (i)(1)(D), this requirement would be expanded such that employees exposed to lead, even if below the PEL, would be included. Also, the washing requirements would be expanded, to include washing exposed arms. In addition to requirements for washing before eating, drinking, smoking or applying cosmetics, employers would be required to ensure that employees exposed to lead wash prior to entering eating areas, and at the end of their shift.

These amendments are necessary to provide greater health protection to employees from the hazard of lead ingestion due to lead that may be on their exposed arms, in addition to their hands and face. These body parts can become contaminated with lead, even when airborne levels of lead are below the PEL.

S**ubsection (i)(4)**
These proposals would remove a reference to title 24, as it is an obsolete reference to the California Building Code. In addition, the existing language in subsection (i)(4)(C) would be removed, as its requirements would be moved to subsection (i)(1)(D).

Subsection (i)(4)(D)
The subsection would be redesignated as subsection (i)(4)(C).

Subsection (i)(5)
The heading of subsection (i)(5) would be changed from "Lavatories" to "Cleaning of Hygiene Facilities." In addition, language would be added that requires employers to develop and implement written methods and schedules to maintain the cleanliness of the hygiene facilities required by subsection (i).

These changes are necessary to require employers to have a documented system in place to ensure that required hygiene facilities are maintained in a clean condition, so that the likelihood of ingestion of lead is reduced.

Subsection (j) Medical Surveillance.

Subsection (j)
This subsection establishes requirements for medical surveillance.

Subsection (j)(1)(A)
These proposals would expand the scope of subsection (j)(1)(A) by reducing the amount of lead exposure allowed before a medical surveillance program must be made available to an employee.

Subsection (j)(1)(A)1.
Employers would be required to institute a medical surveillance program for employees who are or may be exposed to lead at or above the action level. An exception would be given if an employee is not exposed at or above the action level for 10 or more days in any 12 consecutive months and is not exposed on any day at or above 100 µg/m^3 as an 8-hour TWA, without regard to respirator use. This is a change from the existing threshold for a medical surveillance program of exposure for more than 30 days per year at or above the action level.

This amendment is necessary to support the overall goal of maintaining employee BLLs below 10 µg/dl. Employees exposed to lead for up to 30 days a year, as is currently allowed, may well develop BLLs above 10 µg/dl, and yet not be covered by medical surveillance. Likewise, employees who are exposed to lead at or above 100 $\mu g/m^3$ on any day may develop elevated blood lead levels, even though these exposures may be infrequent. Significantly, blood lead testing detects elevated BLLs that occur due to ingestion of lead, as well as due to inhalation of airborne lead. Expanded medical surveillance means that increasing BLLs would be detected earlier, and lead-related adverse health effects would be detected at an earlier stage, thus preventing more severe employee health damage.

These proposals would use a formal exception to specify when medical surveillance is not required for employees covered by subsection (j)(1)(A)1.

This is necessary to make clear that, if the exception is claimed, it is the employer's duty to ensure and be able to demonstrate that the conditions of the exception are met.

Subsection (j)(1)(A)2.
Employers would be required to institute a medical surveillance program, as interim protection, for all employees who perform PHLW. Requiring medical surveillance, as interim protection for employees who perform PHLW, as a default ensures these exposed employees are covered, irrespective of the timing of an employer's compliance with exposure monitoring requirements.

This amendment is necessary to ensure that rising BLLs and lead-related adverse health effects are detected early, and supports the overall goal of maintaining employee BLLs below 10 µg/dl.

Subsection (j)(1)(D)
This new subsection would establish requirements for employers to provide complete employee demographic information to healthcare providers who perform medical surveillance under subsection (j)(2) or (j)(3) of this standard, and also require employers to instruct these healthcare providers to provide laboratories that analyze blood lead tests with the employee demographic information.

This addition is necessary so that more complete demographic information would be provided to the California Occupational Blood Lead Registry, as required by the California Health and Safety Code 124130. Laboratories performing lead analyses on blood samples drawn in California are required by law to report electronically all results to CDPH. Reports of adult blood lead levels are entered into the California Occupational Blood Lead Registry. This information is then used to identify cases of occupational lead poisoning that must be investigated by CDPH, as well as to target employers and industries for CDPH's occupational lead poisoning prevention efforts. The proposed language in subsection (j)(1)(D) closely follows language in the California Health and Safety Code 124130, which mandates information that laboratories must report to CDPH.

Subsection (j)(2)
These proposals would change the heading of subsection (j)(2) from "Biological Monitoring" to "Blood Lead Testing." This change is necessary as existing requirements for ZPP sampling and analysis would be removed from subsection (j)(2); subsection (j)(2) would establish requirements related only to blood lead testing and analysis. This change is necessary because the ZPP test would no longer be a routine part of medical surveillance. Kosnett et al. (2007) reported that routine measurement of zinc protoporphyrin is not recommended because it is an insensitive biomarker of lead exposures in individuals with blood lead concentrations below 25 µg/dl. Therefore, ZPP testing would only be required as part of a medical examination, pursuant to subsection (j)(3), for employees with blood lead levels at or above 20 µg/dl.

Subsection (j)(2)(A)
This subsection establishes requirements for the timing and frequency with which blood lead testing must be made available to employees. The heading of subsection (j)(2)(A) would be changed from "Blood Lead and Zinc Protoporphyrin Sampling and Analysis" to "Blood Lead Testing Schedule" to reflect the removal of ZPP testing requirements from this paragraph. Also in subsection (j)(2)(A), a reference to biological monitoring would be removed, along with references to ZPP, and the phrase "sampling and analysis for lead and ZPP levels" would be replaced by "lead testing."

These proposals would amend the requirements given in subsection (j)(2)(A) for the timing and frequency of blood lead testing which employers are required to make available to specified employees.

Subsection (j)(2)(A)1.
This subsection would be modified such that prior to assignment of an employee to work covered by subsection (j)(1)(A), or as soon as possible when this is determined, employers would be required to make blood lead testing available.

This change is necessary to establish baseline BLLs of employees before they begin work that involves significant, or presumed significant, airborne levels of lead. In this way, employees would have a baseline BLL against which to measure the results of subsequent tests. Also, any pre-existing elevation in an employee's BLL, whether occupational or non-occupational, could be identified, and employees with pre-existing elevated BLLs could be protected from further exposure to lead.

Subsection (j)(2)(A)2.
New language would be added under the designation subsection (j)(2)(A)2., which would require that blood lead testing be made available to employees covered under subsection (j)(1)(A) at least every 2 months for the first 6 months, and every 6 months thereafter. This represents a change from the current requirement, given in existing subsection (j)(2)(A)1., that

blood lead testing be made available at least every 6 months to employees covered by subsection (j)(1)(A).

This addition is necessary as it is important to frequently monitor an employee's BLL during the first six months of exposure as their BLL may rise as a result of increased exposure. Frequent testing means that any rise in BLL will be detected early. In addition, this change is consistent with the current requirements given in existing section 1532.1(j)(2)(A)1.

Subsection (j)(2)(A)3.
New language would be added under the designation subsection (j)(2)(A)3., which would require blood lead tests to be provided at least every 2 months for the first 6 months after a change in task resulting in, or likely to result in, higher exposure to lead, and then every 6 months thereafter.

This addition is necessary as it is important to more frequently monitor an employee's BLL when their exposure to lead is increased. Increased exposure may lead to a sudden rise in an employee's BLL, which must be detected early.

These proposals would remove the existing language in subsection (j)(2)(A)4.

This change is necessary, as ZPP testing would no longer be required on a routine basis (see discussion of ZPP in subsection (j)(2) above).

Subsection (j)(2)(A)4.
These proposals would modify language currently found under the designation subsection (j)(2)(A)2. The phrase "blood sampling and analysis indicated a" would be removed.

This change is necessary to reflect the removal of ZPP testing requirements from this subsection (see discussion of ZPP in subsection (j)(2) above).

In addition, blood lead testing would be required to be made available at least every two months for an employee whose last BLL was at or above 10 µg/dl but below 20 µg/dl of whole blood, rather than the existing requirement for blood testing to be made available every two months when an employee's blood lead level is at or above 40 µg/dl. Providing testing every 2 months would be required to continue until two consecutive BLLs, taken at least 30 days apart, are below 10 µg/dl, rather than the existing requirement of two consecutive BLLs of 40 µg/dl.

These amendments are necessary to ensure that any BLL at or above 10 µg/dl is closely monitored until it is reduced to below 10 µg/dl. This supports the overall goal of maintaining employee BLLs below 10 µg/dl.

Subsection (j)(2)(A)4.
With these proposals, blood lead levels in subsection (j)(2)(A)4., and throughout the regulation would be referred to in units of "µg/dl" of whole blood rather than the equivalent but outdated unit "µg/100 g."

This change is necessary to update the language of this section. In addition, µg/dl is the unit used in section 1532.1, which was adopted in 1993.

Subsection (j)(2)(A)5.
These proposals would modify language currently found under the designation subsection (j)(2)(A)3. In subsection (j)(2)(A)5., a requirement for making blood lead testing available at least monthly for employees whose last BLL was at or above 20 µg/dl would be added.

This addition is necessary, because by requiring the provision of periodic and repeated blood lead testing on a more frequent basis and at lower BLLs, elevations in an employee's blood lead level would be discovered earlier, enabling an employer to take actions to reduce the employee's exposure to lead. In this way, employees' BLLs would be reduced and the prevalence of adverse health effects from exposure to lead would be reduced.

Subsection (j)(2)(B)
These proposals would remove the existing language in subsection (j)(2)(B)**.** This language requires a second, confirmatory blood lead test be conducted whenever an employee's BLL is at or above the criterion for medical removal protection, before the employee is removed from on-going exposure.

This change is necessary to provide greater protection of employee health. It is more protective of an employee's health to not be required to wait for confirmatory results from a mandated follow-up blood lead test before removing an employee from exposure to lead. This change is facilitated by the increased reliability of blood lead testing and analysis since the time the regulation was promulgated in 1978.

Subsection (j)(2)(B)
These proposals would replace the existing language in subsection (j)(2)(B)**,** which was removed, with language previously found under the designation subsection (j)(2)(C). Proposed subsection (j)(2)(B) establishes requirements for the accuracy of blood lead testing. References to "blood lead level sampling and analysis" would be replaced with "blood lead testing."

This change is necessary for consistency with the language that is proposed throughout this subsection.

These proposals would remove the requirement that blood lead testing meet a stated accuracy, and be conducted by a laboratory licensed by Federal OSHA, and replace it with a requirement

that blood lead testing include analysis by a CLIA-approved laboratory (under the federal CLIA regulations).

This change is necessary because Federal OSHA no longer directly approves blood lead testing laboratories; Federal OSHA recognizes that the CLIA criteria for blood lead proficiency testing constitute the federal government's legal requirements for laboratories performing human blood lead testing.

Subsection (j)(2)(C)
These proposals would move, and modify, language currently found under the designation subsection (j)(2)(D) to subsection (j)(2)(C).

Subsection (j)(2)(C)
The term "biological monitoring" would be replaced by "blood lead test." This change is necessary because the requirements in this subsection would pertain to blood lead testing only.

Also in proposed subsection (j)(2)(C), the requirement for employers to notify employees in writing of specified information, including blood lead test results, would be modified, removing the condition that the employer is only required to notify an employee if their blood lead level is at or above 40 µg/100 g.

This change is necessary to provide information and thus greater health protection to all employees who have had blood lead testing, by ensuring that they are notified of their blood lead test results and other relevant information.

Subsection (j)(2)(C)2.
These proposals would replace the current language in subsection (j)(2)(D)2. with new language in proposed subsection (j)(2)(C)2. These proposals would add, to a currently-required written notification to employees, a requirement that employers notify employees about medical examinations and consultations that employers must make available. The requirement to make these examinations and consultations available is located in subsection (j)(3)(A).

This addition is necessary to provide information, and thus greater health protection, to employees about the medical examinations and consultations that are available to them under subsection (j)(3)(A).

Subsection (j)(2)(C)3.
These proposals would modify language currently found under the designation subsection (j)(2)(D)2. and move it to new subsection (j)(2)(C)3**.** Proposed subsection (j)(2)(C)3. establishes the requirements for employee notification about temporary medical removal with MRP benefits. The language would be modified to require employers to notify all employees, regardless of their BLL, about MRP and its benefits when they are notified of their BLL. In

addition, employers would be required to notify employees of the specific BLL criteria for medical removal under subsection (k)(1).

These modifications are necessary to provide information, and thus greater health protection, by ensuring that all employees who have their BLL tested are made aware of temporary medical removal, the criteria for removal and MRP benefits. This would also help ensure continued employee participation in future BLL testing.

Subsection (j)(2)(D)
These proposals would establish a new subsection (j)(2)(D), with the heading "Physician's Notification to the Employee." Subsection (j)(2)(D) would require the employer to ensure that the physician who orders a blood test for an employee explains the findings of the blood lead test, and notifies the employee of specified information.

This addition is necessary to ensure that employees receive information directly from the physicians who order their blood lead tests, about any recommended follow-up blood lead tests or medical exams, so that employees gain a better understanding of the significance of their blood lead test results.

Subsection (j)(2)(E)
These proposals would establish a new subsection (j)(2)(E). Subsection (j)(2)(E) would require a response by employers when an employee has a BLL at or above 10 µg/dl. In that event, the employer would be required to establish and implement a written elevated blood lead level response plan with a description of means that would be used to reduce and maintain that employee's BLL below 10 µg/dl. This plan would be accompanied by any needed training and instruction to correct employee work practices, as identified by the plan.

This addition is necessary to provide greater health protection to employees in that employers would be required to take steps to reduce elevated employee BLLs, even though they may not reach a level at which temporary medical removal is required. This supports the overall goal of maintaining all employee BLLs below 10 µg/dl.

Subsection (j)(3)
This subsection establishes requirements for medical examinations and consultations. Employers are required to make medical examinations and consultations available, as specified in subsection (j)(3), to each employee covered under subsection (j)(1)(A).

Subsection (j)(3)(A)
This subsection specifies the frequency with which medical examinations and consultations must be made available. These proposals would amend this subsection as detailed below.

Subsection (j)(3)(A)1.
These proposals would replace a reference to "blood sampling test" with "blood lead test." This amendment is necessary to provide consistency with the language proposed for use throughout this standard.

Also in subsection (j)(3)(A)1., the BLL at which medical exams and consultations would be required to be made available to employees would be lowered from at or above 40 µg/dl to at or above 20 µg/dl.

This amendment is necessary to provide greater health protection to employees exposed to lead, in that an examination conducted when an employee's BLL is 20 µg/dl would detect lead-related adverse health effects at an earlier stage than an examination conducted when an employee's BLL reaches 40 µg/dl.

In addition, these proposals would amend the existing language in subsection (j)(3)(A)1. to require that the subject medical examinations be made available as soon as possible, if no lead-specific medical examination was done for that employee in the preceding 12 months.

This amendment is necessary to provide greater health protection to employees by ensuring that these employees are provided with medical examinations and consultations in a timely manner when an elevated BLL has been identified, while allowing that such an examination need only be performed once in a 12 month period.

Subsection (j)(3)(A)2.
These proposals would modify the existing language by adding, after the words "8-hour time-weighted," the word "average." This change is necessary to ensure consistent nomenclature within the standard.

Subsection (j)(3)(A)3.
These proposals would amend the term "fitting test" to "fit test." This change is necessary to correctly identify the test by referring to it by its proper name.

Subsection (j)(3)(A)4.
These proposals would modify the language to specify that the medical exams and consultations employers are required to make available to employees removed from exposure to lead are to be made available as soon as possible.

This amendment is necessary to provide greater health protection to employees by ensuring that these employees are provided with medical exams and consultations in a timely manner, and also for consistency with subsection (j)(3)(A)3.

In addition, language in proposed subsection (j)(3)(A)4. would be amended to include the requirement that medical examinations and consultations are to be provided to employees removed from exposure to lead due to elevated BLLs, per the provisions of subsection (k)(1)(A).

Although this requirement is also found in subsection (j)(3)(A)1., it is necessary to amend subsection (j)(3)(A)4. to state the requirement explicitly, because subsection (j)(3)(A)4. specifically addresses employees who are removed from exposure to lead, while subsection (j)(3)(A)1. does not.

Also, the language in proposed subsection (j)(3)(A)4. would be amended to delete the term "a risk of sustaining material impairment to health" and add language to specify that medical examinations and consultations are to be made available to each employee whose exposure to lead is otherwise limited pursuant to a final medical determination in compliance with the provisions of subsection (k)(2).

This amendment is necessary to more clearly state the requirement, because the term "a risk of sustaining material impairment to health" is vague and ambiguous.

Subsection (j)(3)(B)
This subsection establishes the content of medical evaluations and consultations required by this section.

Subsection (j)(3)(B)
These proposals would expand the scope of the medical examinations subject to the content requirements of subsection (j)(3)(B) to include all those made available pursuant to subsections (j)(3)(A). Subsection (j)(3)(B) would refer to subsection (j)(3)(A), rather than subsections (j)(3)(A)1. – 2.

This amendment is necessary to provide greater health protection to employees by ensuring that all medical examinations made available pursuant to subsection (j)(3)(A) include the elements necessary to diagnose adverse health effects related to an employee's exposure to lead, as well as pre-existing health-related conditions that could be exacerbated by exposure to lead.

These proposals would move a requirement currently located in subsection (j)(3)(B)6., which requires that medical exams made available pursuant to subsections (j)(3)(A)3. – 4. include pregnancy testing or laboratory evaluation of male fertility when requested by an employee, to subsection (j)(3)(B)2. The language moved to subsection (j)(3)(B)2. would refer to all medical examinations made available pursuant to subsection (j)(3)(A).

These changes are necessary, as in this proposal, the requirement would apply to the required content for all medical examinations made available pursuant to subsection (j)(3)(A), and thus

provide greater health protection to employees. This requirement, which evaluates the reproductive system, is appropriate to include in subsection (j)(3)(B)2., which lists the bodily systems that are to be included in a thorough physical examination.

Subsection (j)(3)(B)4.c.
The requirement for ZPP testing would be amended in that it would be required only for those employees whose last BLL was at or above 20 µg/dl.

This amendment is necessary because zinc protoporphyrin is an insensitive biomarker of lead exposures in individuals with blood lead concentrations below 25 µg/dl, and is not recommended for routine measurement (Kosnett et al., 2007).

Subsection (j)(3)(B)6.
The words "relevant to lead exposure" would be added. This addition is necessary for consistency with the requirements of section 1532.1(j)(3)(B)6.

Also in subsection (j)(3)(B)6., the requirement that the content of medical examinations made available pursuant to subsections (j)(3)(A)3. – 4. be determined by an examining physician would be removed. In the proposed language, rather than being determined by an examining physician, the content of all medical examinations made available pursuant to subsection (j)(3)(A) would be specified in subsection (j)(3)(B)1. – 6.

This amendment is necessary to provide greater health protection to employees by ensuring that all medical examinations made available pursuant to subsection (j)(3)(A) include the elements necessary to diagnose adverse health effects related to an employee's exposure to lead, as well as pre-existing health-related conditions that could be exacerbated by exposure to lead. The examining physician would retain the ability to order any other test relevant to lead exposure they deem necessary by sound medical practice, under the provisions of subsection (j)(3)(B)6.

Subsection (j)(3)(C)2.
These proposals would make nonsubstantive, grammatical changes to subsection (j)(3)(C)2. These changes are necessary to add clarity to the meanings of these subsections.

Subsection (j)(4)
These proposals would modify the language in subsection (j)(4).

Subsection (j)(4)(A)5.
The word "determinations" would be replaced by "test results." This amendment is necessary for greater clarity and to avoid confusion with other uses of the word "determination" in this standard.

Subsection (j)(4)(A)7.
Also, these proposals would add a new subsection, (j)(4)(A)7., which would require that employers provide to an initial physician conducting a medical examination or consultation under this section a copy of the employer's written elevated blood lead level response plan as required by subsection (j)(2)(E)1.

This addition is necessary to ensure that the physician has accurate information about the means the employer will use to reduce and maintain the employee's BLL below 10 µg/dl.

These proposals would move the requirements currently located in subsection (j)(5) to proposed subsection (j)(6).

Subsection (j)(5)
The heading of subsection (j)(5) would be changed to "Physician's written medical report for the employee." In addition, these proposals would add new language to establish a requirement for the employer to ensure that an explanation and written report is provided directly from the physician to the employee within 30 days following a medical examination. The requirements for the written report are contained in proposed subsections (j)(5)(A) - (F).

These amendments are necessary to ensure that employees receive information directly from the physician who performs a medical examination for them about any recommended follow-up blood lead testing and medical examinations, as well as the physician's opinion as to whether the employee has any health-related condition, occupational or non-occupational, that dictates further medical examination or treatment. The new language in subsection (j)(5) is adapted from the medical surveillance language in General Industry Safety Orders, section 5204(i)(5) (Occupational Exposures to Respirable Crystalline Silica). Section 5204(i)(5) sets a precedence for the employer being required to ensure the physician communicates results and next steps to the employee directly. Other regulations, directly governing physicians, require that physicians communicate this information to their patients. However, it is necessary to include this requirement in the lead regulation because physicians who conduct medical examinations required by the lead regulation may feel that, because they are under contract with the employer, they must wait for the employer to take the first step in communicating results to employees and arranging for follow-up medical examinations. This amendment is also necessary to avoid any gap in medical care related to lead medical surveillance that may result due to indirect communication of medical information to the employee.

These proposals would move the existing language in subsection (j)(6) to a new subsection (j)(7).

Subsection (j)(6)
The heading for subsection (j)(6) would be amended to "Physician's Written Medical Opinion for the Employer." This change is necessary to distinguish the "Physician's Written Medical

Opinion for the Employer," which would be required by subsection (j)(6), from the "Physician's Written Medical Report for the Employee," which would be required by subsection (j)(5).

The requirements in revised subsection (j)(6) would include the requirements given in existing subsection (j)(5), with a few modifications as detailed below.

Subsection (j)(6)(A)
Language would be added to require employers to obtain a written medical opinion from the examining physician within 30 days of the medical examination.

This addition is necessary to ensure that the employer obtains the written medical opinion from the examining physician in a timely manner, such that the employer can comply with the proposed requirement of subsection (j)(6)(C).

Subsection (j)(6)(A)1.
These proposals would modify the language redesignated as subsection (j)(6)(A)1. to add a requirement that each written medical opinion from an examining or consulting physician include an opinion as to whether an employee has any detected condition that would place the employee's ability to procreate a healthy child at risk due to exposure to lead. In addition, the word "medical" would be replaced by the term "health-related." These changes would make references to "the ability to procreate a healthy child" in language that is not gender-specific, and without using the word "pregnancy." The wording "ability to procreate a healthy child" is used in the existing language of subsection (j)(3)(A)3.

These changes are necessary to avoid, by implication, calling pregnancy a "medical condition," and to make clear that an employee's reproductive health, including pregnancy, is protected as part of the employee's overall health.

Subsection (j)(6)(A)4.
In the language redesignated as subsection (j)(6)(A)4., the phrase "results of the blood lead determinations" would be replaced with "employee's blood lead test results."

This change is necessary to clarify that the written medical opinion must include blood lead test results for the employee who had the examination. The change is also necessary to avoid confusion with other uses of the word "determination" in this standard.

Subsection (j)(6)(C)
In new language proposed in subsection (j)(6)(C), a requirement is added for the employer to ensure that the employee receives a copy of the physician's written medical opinion within 30 days of each medical examination performed.

This addition is necessary to ensure that the employee receives the physician's written medical opinion in a timely manner. This requirement is adapted from the medical surveillance language in the General Industry Safety Orders, section 5204(i)(6)(C) (Occupational Exposures to Respirable Crystalline Silica).

Subsection (j)(7)
These proposals would redesignate subsection (j)(6) and its current requirements as subsection (j)(7).

Subsection (j)(7)(A)
The word "he" would be replaced with "the employer." This change is necessary for greater clarity, as well as to avoid assigning a gender to employers.

Subsection (k) Medical Removal Protection.

Subsection (k)
This subsection establishes requirements for MRP.

Subsection (k)(1)
This subsection establishes requirements for the temporary removal of an employee from specified working conditions when an employee's BLL is elevated as described in subsections (k)(1)(A), (B) or (C).

Subsection (k)(1)
These proposals would add to subsection (k)(1) the requirements that employers remove employees placed on MRP from altering or disturbing any material containing lead at a concentration equal to or greater than 0.5% by weight and from torch cutting any scrap metal.

These additions are necessary to prevent all significant lead exposure to employees who are placed on MRP. Under the current requirements, employees placed on MRP could be exposed to significant amounts of lead while altering or disturbing material containing lead, or torch cutting any scrap metal, even if the airborne concentration of lead is below the action level. The inclusion of torch cutting any scrap metal is necessary because torch cutting is often used to reduce the size of large-sized structural steel scrap that can contain coatings containing lead at 0.5% by weight or greater. It is often the case that these coatings are untested and the presence of lead unidentified.

These proposals would add to subsection (k)(1) new subsections (k)(1)(A), (B) and (C), which would specify the BLLs at which employees must be removed from work with lead, as described in subsection (k)(1). The existing requirement is that an employee must be removed from work with lead when a periodic and a follow-up blood lead test indicate that the employee's BLL is at or above 50 µg/dl.

Subsections (k)(1)(A) – (C)
These proposals would establish three conditions under which an employer would be required to remove an employee from work with lead, as described in subsection (k)(1): (1) proposed subsection (k)(1)(A) would establish the requirement that an employee be removed from work with lead as described in subsection (k)(1) when their last BLL is at or above 30 µg/dl; (2) proposed subsection (k)(1)(B) would establish, one year after the effective date, the requirement that an employee be removed from work with lead as described in subsection (k)(1) when their last two BLLs are at or above 20 µg/dl; and (3) proposed subsection (k)(1)(C) would establish, one year after the effective date, the requirement that an employee be removed from work with lead as described in subsection (k)(1) when the average of all of their BLLs in the prior six months is at or above 20 µg/dl.

These changes are necessary to provide added health protection to employees whose BLLs are elevated, such that they are at risk of experiencing or developing adverse health effects as the result of their exposure to lead, and are based on the recommendations of Kosnett et al. (2007). The one year delay in the effective dates of subsections (k)(1)(B) and (k)(1)(C) is necessary in order to allow time for compliance with (k)(1)(A). to reduce the impact on employers of complying with (k)(1)(B) and (k)(1)(C).

Furthermore, the addition of the removal criterion given in subsection (k)(1)(C) is necessary to ensure that MRP is not avoided by employers through the persuasion of employees to decline follow-up blood testing after one of their BLLs is at or above 20 µg/dl.

Subsection (k)(2)
This subsection establishes requirements for the temporary removal of an employee from specified working conditions due to a final medical determination as described in subsection (k)(2)(A).

Subsection (k)(2)(A)
These proposals would modify the language in subsection (k)(2)(A) to expand the conditions under which employers would be required to remove an employee from work with lead as described in subsection (k)(2)(A), to include each occasion that a final medical determination results in a medical finding, determination, or opinion that such an employee has a detected condition that would place the employee's ability to procreate a healthy child at risk due to exposure to lead. In addition, the word "medical" would be replaced by the term "health-related." These changes would make references to "the ability to procreate a healthy child" in language that is not gender-specific, and without using the word "pregnancy." The wording "ability to procreate a healthy child" is used in the existing language of subsection (j)(3)(A).

These changes are necessary to avoid, by implication, calling pregnancy a "medical condition," and to make clear that an employee's reproductive health, including pregnancy, is protected as

part of the employee's overall health. The term "medical condition" has been replaced with "health-related condition" throughout the proposed regulation for the same reasons. In addition, new proposed language exclusively uses the term "health-related condition" for clarity and consistency.

These proposals would move the language in existing subsection (k)(2)(A) regarding the phrase "final medical determination" into subsection (k)(2)(B), as well as modify this language.

This change is necessary for consistency with the language used in section 1532.1(k)(1)(B)2.

Subsection (k)(2)(C).
These proposals would redesignate the language in existing subsection (k)(2)(B) as new subsection (k)(2)(C). This change is necessary for consistency with the format used in section 1532.1(k)(1)(B).

Subsection (k)(3)
This subsection establishes conditions for the return of an employee to their former job status following medical removal.

Subsection (k)(3)(A)1.
These proposals would modify the language of subsection (k)(3)(A)1. to clarify that this subsection applies to employees removed under the provisions of subsection (k)(1). A reference to "blood sampling tests" would be changed to "blood lead tests."

These modifications are necessary for clarity and consistency with proposed language throughout this standard.

In addition, the language in subsection (k)(3)(A)1. would be changed, such that the BLL that must be achieved for an employer to return an employee to his or her former job status would be changed from below 40 µg/dl to below 15 µg/dl.

This change is necessary to provide added protection to employees who have elevated BLLs by preventing additional exposure to lead until their BLLs decline to significantly below the level at which MRP is required.

Also, language would be added to require that when an employee has been medically removed under the provisions of subsection (k)(1), the employer shall return the employee to his or her former job status when two consecutive tests, taken at least 30 days apart, both indicate that the employee's BLL is below 15 µg/dl.

This change is necessary to ensure that a decline in an employee's BLL is persistent over a 30 day period rather than being a short-lived condition.

Subsection (k)(3)(A)2.
These proposals would add language in subsection (k)(3)(A)2. to establish that when an employee is removed from work with lead due to a final medical determination, the employee's return to his or her former job status would be dependent on a subsequent final medical determination that the employee no longer has a detected condition that would place the employee's ability to procreate a healthy child at risk due to exposure to lead. In addition, the word "medical" would be replaced by the term "health-related." These changes would make references to "the ability to procreate a healthy child" in language that is not gender-specific, and without using the word "pregnancy." The wording "ability to procreate a healthy child" is used in the existing language of subsection (j)(3)(A).

These changes are necessary to avoid, by implication, calling pregnancy a "medical condition," and to make clear that an employee's reproductive health, including pregnancy, is protected as part of the employee's overall health.

Subsection (k)(5)
These proposals would modify the language in subsection (k)(5) such that the term "alternate medical determination mechanism" would be changed to "alternate physician determination mechanism."

This change is necessary to provide consistency with the language used in subsection (j)(3)(D).

Subsections (k)(6)(B) and (C)
These proposals would amend the language in subsections (k)(6)(B) and (C) to add to the meaning of MRP benefits the employee's right to their former job status, and to make several other minor changes.

These changes are necessary for consistency with the language of section 1532.1(k)(2)(B) and (C).

Subsection (k)(6)(G)
A reference to subsection (k)(5)(A) would be changed to subsections (k)(6)(A) and (B). This change is necessary to correctly identify the subsections that specify MRP benefits.

Subsection (*l*) Employee Information and Training.

Subsection (*l*)
This subsection establishes requirements for the provision of information and training to employees.

Subsection (*l*)(1)(A)
These provisions would expand the scope of workplaces subject to the requirements of subsection (*l*)(1)(A).

The language in subsection (*l*)(1)(A) would be modified such that employers would be required to provide specified information to all employees with occupational lead exposure, rather than limiting this requirement to workplaces in which there is potential exposure to airborne lead.

This change is necessary as employees could have significant occupational exposure to lead, through ingestion, even in the absence of airborne lead exposure.

These proposals would expand the requirements in subsection (*l*)(1)(B) and add three new subsections, (*l*)(1)(B)1. – 3.

Subsection (*l*)(1)(B)1.
A training program would be required for employees exposed to lead above the action level on any day.

This change is necessary to clarify that employees with exposure to lead above the action level on any day must be included in a lead training program, and is consistent with the existing language used in section 1532.1(*l*)(1)(B).

S**ubsection (*l*)(1)(B)2**.
Lead arsenate and lead azide would be given as examples of compounds that may cause skin or eye irritation.

This change is necessary for clarity and is consistent with the language used in section 1532.1(*l*)(1)(B).

Subsection (*l*)(1)(B)3.
This subsection would require inclusion in a lead training program, as interim protection for employees who perform PHLW.

This change is needed to provide greater health protection to exposed employees, where an exposure assessment has not been conducted, by providing them with comprehensive information about lead, how to prevent exposure, their rights under the standard and the importance of medical surveillance.

These proposals would redesignate subsection (*l*)(1)(C) as subsection (*l*)(1)(D).

Subsection (*l*)(1)(C)
A new requirement would be added under proposed subsection (*l*)(1)(C) to require that employers ensure that training and training materials are appropriate to the educational level, literacy level and language of employees.

This addition is necessary for added protection to employees by ensuring that they understand the information in the training that is provided to them, and is consistent with language used in other sections, including section 5199 (Aerosol Transmissible Diseases).

Subsection (*l*)(1)(D)
In addition, the language in existing subsection (*l*)(1)(D) would be replaced by new language, which incorporates the requirements of existing subsections (*l*)(1)(C) and (*l*)(1)(D).

Also in proposed subsection (*l*)(1)(D), language would be added to clarify which employees the requirements would apply to, as well as the training content that would be required.

These additions are necessary for added clarity.

Subsection (*l*)(1)(E)
This subsection specifies the topics that must be covered in a lead training program. A number of topics would be added to the training requirements given in subsection (*l*)(1)(E).

The addition of training topics is necessary to ensure employees receive information on the hazards of lead that reflects current evidence about its effect on health, the routes of exposure and the means of protection. This additional information will enable employees to better understand the importance of minimizing their exposure to lead to protect their health.

Subsection (*l*)(1)(E)
These proposals would modify the requirements of subsection (*l*)(1)(E) by adding language to require effective training.

This addition is necessary to provide added protection to employees by ensuring that training provided to them fulfills its purpose.

Also, a reference would be added to subsection (*l*)(1)(B).

This addition is necessary to clarify that subsection (*l*)(1)(B) specifies which employees are covered by the training requirements.

Subsection (*l*)(1)(E)2.
Information on the nature of operations which constitutes PHLW would be added to the required training topics.

This addition is necessary because significant exposures to lead can occur when an employee performs PHLW, even if the action level is not exceeded.

In addition, the words "at or" would be inserted before "above the action level."

This change is necessary because the relevant requirements of this section are contingent on exposures at or above the action level.

Subsection (*l*)(1)(E)3.
New language would be added, to require that training includes information on the importance of effective hygiene practices, and how to remove lead contamination from skin with the use of special cleansing compounds, in accordance with subsection (i)(1)(C).

These additions are necessary because proper hygiene is required to prevent significant exposures to lead that can occur through ingestion via lead contamination on the hands and skin. Training on the use of special cleansing compounds is necessary because under subsection (i)(1)(C), employers would be required to make these compounds available, where necessary for lead removal from skin surfaces.

Subsections (*l*)(1)(E)4. – 5.
Subsections (*l*)(1)(E)3.- 4. would be redesignated as subsections (*l*)(1)(E)4.- 5., respectively.

Subsection (*l*)(1)(E)6.
In proposed subsection (*l*)(1)(E)6., information on the cardiovascular health effects of exposure to lead, as well as information on low-level chronic exposure to lead, would be added to the required training topics currently found in subsection (*l*)(1)(E)4. Also, a reference to "excessive" exposure to lead would be removed.

These additions are necessary to ensure that employees receive important information on health effects, including cardiovascular effects, which can occur at even low levels of lead exposure.

Subsection (*l*)(1)(E)7.
This subsection would contain training requirements currently found in subsection (*l*)(1)(E)4. In addition, language would be added to require that training on damage to both male and female reproductive health includes information that this health damage can be caused by low-level lead exposure, including damage associated with BLLs under 5 µg/dl.

These additions are necessary to ensure that employees receive important information that reproductive health effects can occur at even low levels of lead exposure.

Subsection (*l*)(1)(E)8.
New language would be added, to require that training includes information on the employer's duty to provide medical examinations and consultations upon request to specified employees who desire medical advice about their ability to procreate a healthy child.

This addition is necessary to ensure that employees receive information on their rights to medical examinations and consultations when they notify their employer that they desire medical advice concerning their ability to have a healthy child. Providing this information to employees could result in more employees with lead exposure having examinations and consultations, thus preventing adverse reproductive health outcomes.

Subsection (*l*)(1)(E)9.
New language would be added, to require that training includes information on the routes of exposure to lead.

This addition is necessary to ensure that employees are informed that lead exposure can result from lead in the air they breathe, as well as from lead that they ingest from contaminated hands or other surfaces. Better informed employees will be more likely to use required respiratory protection, and follow hygiene procedures, such as hand washing, thus limiting their exposure to lead.

Subsection (*l*)(1)(E)10.
New language would be added, to require that training includes information on the harm to household members that can be caused by lead contamination on an employee's clothing, shoes and body, as well as in their vehicles.

These additions are necessary to ensure that employees are informed that lead can be transported on their contaminated clothes, shoes and body, and cause harm to their household members, especially to young children and pregnant women. Better informed employees will be more likely to follow proper procedures regarding contaminated PPE and clothing, and hygiene, including showering. Exposure to lead would be reduced, both for the employee and their household members.

Subsection (*l*)(1)(E)11.
New language would be added, to require that training includes the recommendation to shower to minimize take-home lead exposure. In addition, a note would be added, clarifying the conditions under which an employer must provide shower facilities and ensure their use.

These additions are necessary to ensure that employees are informed that showering immediately upon returning home from work is recommended. Better informed employees will be more likely to shower, thus reducing lead exposure to employees and their household members.

Subsection (*l*)(1)(E)12. – 14.
Current subsections (*l*)(1)(E)5. – 7. would be redesignated as subsections (*l*)(1)(E)12. – 14., respectively.

Subsection (*l*)(1)(E)15.
These proposals would add new subsection (*l*)(1)(E)15., with new language which would require training to include information about the employee's right of access to their exposure and medical records under section 3204.

This addition is necessary to provide consistency with the training requirements of section 1532.1(*l*)(2)(O).

Subsection (m) Communication of Hazards.

Subsection (m)
This subsection establishes requirements for communication about lead and its hazards, including those under the provisions of section 5194 (Hazard Communication).

Subsection (m)(1)(B)
These proposals would add to subsection (m)(1)(B) the requirement that in classifying the hazards of lead under section 5194, cardiovascular effects are to be addressed.

This addition is necessary as it is now known that cardiovascular effects are one of the health effects that can develop from exposure to even low levels of lead.

In subsection (m)(2)(A), the phrase "in each work area where" would be deleted.

This deletion is necessary, as the phrase would be added in new subsections (m)(2)(A)1. and (m)(2)(A)2.

These proposals would add two new subsections, (m)(2)(A)1. and (m)(2)(A)2.

Subsection (m)(2)(A)1.
The existing language in subsection (m)(2)(A) would be modified such that the requirement to post warning signs about the danger of lead would apply in each work area where employee exposures are at or above the action level.

This change is necessary to support the overall goal of maintaining employee BLLs below 10 µg/dl. Significant exposure to airborne lead can occur when airborne levels are at or above the action level. In addition, these areas could have significant levels of lead contamination on surfaces. Surface contamination can result in occupational exposure to lead, through ingestion.

Subsection (m)(2)(A)2.
New language would add the requirement that employers post warning signs about the danger of lead, as interim protection, in each work area where PHLW is performed.

This addition is necessary to provide greater health protection to employees who perform PHLW and an exposure assessment has not been conducted, by communicating to them the hazards of lead and basic hygiene precautions. This requirement also provides a warning to employees who may enter these work areas. Provided with these warnings, employees could take appropriate steps to limit their exposure to lead.

These proposals would redesignate subsections (m)(2)(B), (C) and (D) as subsections (m)(2)(C), (D) and (E), respectively.

Subsection (m)(2)(B)
These proposals would also amend the language of existing subsection (m)(2)(A) by moving the requirements for wording that must be included in a warning sign to proposed subsection (m)(2)(B). Also in proposed subsection (m)(2)(B), the required wording on warning signs would be amended, to state "LEAD WORK AREA," rather than "LEAD."

These changes are necessary for consistency with the requirements in section 1532.1(m)(1)(A).

Subsection (m)(2)(E)
Existing subsection (m)(2)(E) would be removed. This change is necessary as its requirements only applied prior to June 1, 2016.

<u>Subsection (n) Recordkeeping.</u>

Subsection (n)
This subsection establishes requirements for recordkeeping.

Subsection (n)(1)(B)4.
These proposals would modify the language in subsection (n)(1)(B)4. to require a unique identifier (such as date of birth or employee identification number) to be used in lieu of an SSN to identify employees in records of exposure monitoring.

This change is necessary to comply with a Cal/OSHA directive to remove all requirements in its standards to include employee SSNs on exposure monitoring, medical surveillance, or other records, to facilitate employers' efforts to safeguard employee privacy. This directive is in response to Federal OSHA's Standards Improvement Project proposal to remove requirements for including employee SSNs in its regulations.

Subsection (n)(1)(B)5.
The language would be modified, to require that information be recorded about the work operations conducted by individuals who are monitored and the conditions prevailing in employers' operations.

This change is necessary to ensure that sufficient information is recorded to demonstrate the applicability of exposure data to satisfy the requirements of subsections (d)(4), (d)(5), (d)(6) and (d)(7).

Subsection (n)(2)
A new heading, "Written Compliance Program Review," would be added. In addition, new language would be added to this subsection, to require that records of revisions and updates to the employer's written compliance program be retained for three years.

These additions are necessary to ensure that records of revisions and updates to the written compliance programs required by subsection (e)(2)(A) are retained and thus available to serve as documentation of the current status of the employer's lead compliance program as it evolves over time.

The language in existing subsection (n)(2) would be redesignated as subsection (n)(3).

Subsection (n)(3)(B)1.
These proposals would modify the language in proposed subsection (n)(3)(B)1. to require a unique identifier (such as date of birth or employee identification number) to be used in lieu of a social security number to identify employees in records of medical surveillance.

This change is necessary to comply with a Cal/OSHA directive regarding SSNs (see subsection (n)(1)(B)4. above).

Subsection (n)(3)(C)3.
In proposed subsection (n)(3)(C)3., the phrase "biological monitoring" would be replaced with "blood lead testing."

This change is necessary as the requirement to conduct routine ZPP testing would be removed and thus "blood lead testing" more accurately describes the record which must be kept pursuant to this subsection.

Subsection (n)(4)
These proposals would replace existing language with entirely new language in subsection (n)(4). It would be given the new heading "Written Elevated Blood Lead Level Response Plans." The new language in this subsection would require that these plans, required under subsection (j)(2)(E), be retained for three years.

This addition is necessary to ensure that written elevated BLL response plans are retained. The plans would then be available for review, so that implementation of the means of reducing and maintaining an employee's blood lead level below 10 µg/dl could be evaluated over time.

These proposals would redesignate subsection (n)(3) as subsection (n)(5).

Subsection (n)(5)(B)1.
These proposals would modify the language in proposed subsection (n)(5)(B)1. to require a unique identifier (such as date of birth or employee identification number) to be used in lieu of a SSN to identify employees in records of medical removals.

This change is necessary to comply with a Cal/OSHA directive regarding SSNs (see subsection (n)(1)(B)4. above).

Subsection (n)(6)
These proposals would add new subsection (n)(6), with the heading "Training." New language in this subsection would specify the information required in training records, and require that the records be maintained for three years.

This addition is necessary to demonstrate that employees have received the initial, annual or supplemental training (provided in accordance with subsection (j)(2)(E)) required by this section.

These proposals would redesignate subsections (n)(4) and (n)(5) as subsections (n)(7) and (n)(8), respectively.

Nonsubstantive and Editorial Changes

In addition, these proposals would make nonsubstantive and editorial changes to wording in section 5198 to provide greater clarity for employers and also to provide consistency in language amongst the subsections of this regulation.

Appendices

There are four appendices to section 5198: A, B, C and D. Per section 5198(p) Appendices: "The information contained in the appendices to this section is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation."

These proposals would make numerous changes to the appendices. A brief description of these changes is given below. Because the appendices are purely informational, and do not by themselves create any additional obligations not otherwise imposed by section 5198 nor detract from any existing obligation, individual changes proposed for the appendices, and the problem/purpose/necessity for each, are not included in this Initial Statement of Reasons.

Appendix A

These proposals would modify the language in Appendix A – Substance Data Sheet for Occupational Exposure to Lead to reflect current knowledge about the adverse health effects of exposure to lead, as well as changes that are proposed for section 5198.

Appendix B

These proposals would modify the language in Appendix B – Employee Standard Summary to reflect changes that are proposed for section 5198, as well as to reflect current information about the most common chelating agents.

Appendix C

These proposals would modify the language in Appendix C – Medical Surveillance Requirements to reflect current information about the medical evaluation and treatment of exposure to lead, as well as changes that are proposed for section 5198.

Appendix D

These proposals would remove Appendix D - Qualitative Fit Test (QLFT) Protocols from the regulation.

This change is necessary as the History notes for section 5216* indicate that an amendment repealing appendix D and adding an editorial reference was filed 8-25-98; operative 11-23-98 (Register 98, No. 35). This change is also necessary to avoid confusion as there is no reference to Qualitative Fit Test (QLFT), nor requirement to use this method of fit test, in section 5198.

*A change without regulatory effect renumbering section 5216 and appendices A-D to section 5198 was filed 2-16-2000 pursuant to section 100, title 1, California Code of Regulations (Register 2000, No. 7).

TECHNICAL, THEORETICAL AND/OR EMPIRICAL STUDIES, REPORTS OR DOCUMENTS RELIED ON BY THE BOARD

1. BCI (Battery Council International). *Oral Testimony of BCI Representative Ismael Pedroza before Cal/OSHA.* 2015.

2. BCI. *BCI Statement on the Economic Feasibility of the Proposed PEL in Areas Designated for SECALs.* 2015. (Note: confidential business information has been redacted)

3. BEAR (Berkeley Economic Advising and Research, LLC). *Standardized Regulatory Impact Assessment: Revisions to Occupational Lead Standards.* 2019; revised 2020. https://dof.ca.gov/wp-content/uploads/sites/352/Forecasting/Economics/Documents/SRIA_DIR_Lead_Safety_Standards_Revised200830.pdf

4. Cal/OSHA. *Explanatory note: Explanation of Differences in Estimates Prepared by OLPPP and Estimates Used in the SRIA and STD 399 for Lead-Exposed Employees, Establishments and Small Businesses*. 2021.

5. Caltrans (California Department of Transportation). Email to Susan Eckhardt, Cal/OSHA. 2016.

6. CDC (US Centers for Disease Control and Prevention) National Notifiable Diseases Surveillance System. *Lead, Elevated Blood Levels 2016 Case Definition.* 2016. https://ndc.services.cdc.gov/case-definitions/lead-elevated-blood-levels-2016/

7. CDPH (California Department of Public Health). *Letter to Steve Smith, Cal/OSHA.* 2010.

8. CDPH. *Letter to Juliann J. Sum, Cal/OSHA.* 2013.

9. CDPH-OLPPP (Occupational Lead Poisoning Prevention Program). *Spreadsheet provided to Cal/OSHA: Estimates of Lead-Exposed Workers and Establishments by Industry (Revised: 3/13/2018).*

10. CDPH-OLPPP. *Spreadsheet provided to Cal/OSHA: Estimates of Lead-Exposed Workers and Establishments by Sector (Revised: 3/22/2018).*

11. CDPH-OLPPP. *Written communication to Cal/OSHA: Estimating the Number of Lead-Exposed Workers and Affected Employers in CA.* 2017.

12. Council of State and Territorial Epidemiologists. *Public Health Reporting and National Notification for Elevated Blood Lead Levels.* 2015. https://cdn.ymaws.com/www.cste.org/resource/resmgr/2015PS/2015PSFinal/15-EH-01.pdf

13. EDD (California Employment Development Department) LMI (Labor Market Information), Table 2A, Third Quarter, 2018. https://www.labormarketinfo.edd.ca.gov/LMID/Size_of_Business_Data_for_CA.html

14. EDD LMI, Table 2B, Third Quarter, 2018. https://www.labormarketinfo.edd.ca.gov/LMID/Size_of_Business_Data_for_CA.html

15. EPA (US Environmental Protection Agency). *Integrated Science Assessments for Lead.* 2013. https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=255721

16. Kosnett, M.J., et al. *Recommendations for Medical Management of Adult Lead Exposure.* Environmental Health Perspectives. 2007 Mar;115(3):463-71. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1849937/

17. NIOSH (US National Institute for Occupational Safety and Health). *Adult Blood Lead Epidemiology & Surveillance (ABLES).* 2018. https://web.archive.org/web/20180625183327/https://www.cdc.gov/niosh/topics/ables/ReferenceBloodLevelsforAdults.html

18. NTP (US National Toxicology Program). *NTP Monograph on Health Effects of Low-Level Lead*. 2012. http://ntp.niehs.nih.gov/ntp/ohat/lead/final/monographhealtheffectslowlevellead_newissn_508.pdf

19. ODPHP (US Office of Disease Prevention and Health Promotion). *OSH-7 Reduce the Proportion of Persons who have Elevated Blood Lead Concentrations from Work Exposures.* 2022.

20. OEHHA (California Environmental Protection Agency - Office of Environmental Health Hazard Assessment). *Estimating Workplace Air and Worker Blood Lead Concentration using an Updated Physiologically-based Pharmacokinetic (PBPK) Model.* 2013. https://oehha.ca.gov/media/downloads/air/document/finalpboctober2013errata.pdf

21. PASMA (Public Agency Safety Management Association). *Letter to Steve Smith, Cal/OSHA*. 2016.

22. SSPC (The Society for Protective Coatings). *Email to Susan Eckhardt, Cal/OSHA*. 2016.

23. Vork, Kathleen L., Carlisle, James C. *Evaluation and updates to the Leggett model for pharmacokinetic modeling of exposure to lead in the workplace – Part I adjustments to the adult systemic model*. Journal of Occupational and Environmental Hygiene, 2020;17(6):283-300.

24. February 23, 2011, January 17, 2012, June 12, 2014, April 21, 2015, May 28, 2015 and November 10, 2015, Cal/OSHA Advisory Committee minutes http://www.dir.ca.gov/dosh/DoshReg/5198Meetings.htm and attendance sheets.

25. American Textile Mfrs. Inst., Inc. v. Donovan, 452 U.S. 490 (1981) https://supreme.justia.com/cases/federal/us/452/490/

These documents are open to public inspection BY APPOINTMENT Monday through Friday from 8:00 a.m. to 4:30 p.m. at the Standards Board Office located at 2520 Venture Oaks Way, Suite 350, Sacramento, California. Appointments can be scheduled via email at oshsb@dir.ca.gov or by calling (916) 274-5721.

PETITION

This proposal was not the result of a petition.

ADVISORY COMMITTEE

This proposal was developed with the assistance of an advisory committee. (A list of advisory committee members, attendance sheets and minutes are included as Documents Relied Upon.)

FIRE PREVENTION STATEMENT

This proposal does not include fire prevention or protection standards. Therefore, approval of the State Fire Marshal pursuant to Government Code section 11359 or Health and Safety Code section 18930(a)(9) is not required.

SPECIFIC TECHNOLOGY OR EQUIPMENT

This proposal will not mandate the use of specific technologies or equipment.

STANDARDIZED REGULATORY IMPACT ASSESSMENT (SRIA)

Cal/OSHA is proposing a series of revisions to its title 8 occupational lead standards for Construction (section 1532.1) and General Industry (section 5198). The proposed revisions are designed to mitigate adverse health effects for employees who have occupational exposure to lead. The SRIA analyzes the economic impacts of the proposed revisions to title 8 of the California Code of Regulations (CCR) occupational lead standards.

Berkeley Economic Advising and Research, LLC (BEAR) assessed the costs and benefits of the proposed revisions to the occupational lead standards (title 8 CCR sections 1532.1 and 5198) in its SRIA (BEAR, 2020). The results of the analysis are detailed below, respective to requirements for the SRIA.

The complete report is available at:
https://dof.ca.gov/wp-content/uploads/sites/352/Forecasting/Economics/Documents/SRIA_DIR_Lead_Safety_Standards_Revised200830.pdf

Background

Cal/OSHA's proposed changes are based in part on recommendations from the CDPH. The CDPH-OLPPP reviewed the scientific information, including a review from the National Toxicology Program (NTP, 2012) and a report issued by the US Environmental Protection Agency (EPA, 2013), and concluded that there is convincing evidence that chronic, low-level exposure to lead can cause harmful health effects. CDPH concluded that the BLL of employees should not exceed 5-10 µg/dl over a working lifetime. This is consistent with goals set at the federal level by the Office of Disease Prevention and Health Promotion (ODPHP, 2022).

CDPH made health-based recommendations to Cal/OSHA for revising its Construction and General Industry lead standards for the protection of employees who are exposed to lead on the job. In its recommendations, CDPH stated that in order to prevent chronic BLLs at or above 5-10 µg/dl, air lead levels in the workplace must not exceed an 8-hour TWA concentration of 0.5-2.1 µg/m^3. At a PEL of 0.5 µg/m^3, 95% of employees would have a BLL less than 5 µg/dl over their working lifetime. At a PEL of 2.1 µg/m^3, 95% of employees would have a BLL less than 10 µg/dl over their working lifetime. Cal/OSHA concluded that lowering the PEL to this low level was not a feasible regulatory option, but that a PEL of 10 µg/m^3, along with a suite of additional protections, would have the same effect of reducing lifetime blood lead levels to 10 µg/dl for nearly all employees with occupational exposure to lead.

The creation or elimination of jobs in the state.

There is no net anticipated creation or elimination of jobs in California, as compliance costs may reduce jobs in some industries while simultaneously stimulating employment in smaller but more labor-intensive sectors providing compliance equipment and services in the state. The macroeconomic impacts of the regulatory revisions are expected to be quite small, and there is no indication that the regulations will significantly affect the number of jobs in California.

The creation of new businesses or the elimination of existing businesses in the state.

There is no net anticipated creation or elimination of businesses in California. A very small number of businesses may decide to cease operations rather than comply with the new requirements. However, new demand for labor and materials created by each compliance action creates opportunities for new businesses, which will likely increase new businesses in California. The macroeconomic impacts of the regulatory revisions are expected to be quite small, and there is no indication that the regulations will significantly affect the creation or elimination of new businesses in California.

The competitive advantages or disadvantages for businesses currently doing business in the state.

Many of the businesses in the sectors that are most affected by the proposed regulations (for example, construction, firing ranges, security firms and scrap metal recycling) are not particularly susceptible to competition from outside of the state, since the work must be performed in California. All firms engaging in these activities are therefore subject to the proposed regulations. Therefore, California firms are not expected to be at a competitive disadvantage due to the new regulations. The macroeconomic impacts of the regulatory revisions are expected to be quite small, and there is no indication that the regulations will significantly create advantages or disadvantages for businesses in California.

The increase or decrease of investment in the state.

Cal/OSHA held six advisory committee meetings to determine what amendments should be proposed for sections 1532.1 and 5198. The meetings were open to the public. Representatives from industry, labor, occupational medicine, advocacy groups and government agencies participated. All input was considered, and the current proposed regulations reflect a balanced, enforceable and prevention-focused approach to reducing risks related to the presence of lead in workplaces in California. The macroeconomic impacts of the regulatory revisions are expected to be quite small, and there is no indication that the regulations will significantly affect investment in California.

The incentives for innovation in products, materials, or processes.

In nearly all sectors considered in this analysis, the simplifying assumption is made that businesses would comply with the proposed regulations by protecting workers from lead in the workplace. This assumption implies no major changes to the production processes in each sector. However, an alternative compliance option for some sectors would be to find alternative processes that either do not use lead-containing materials, or that prevent the release of lead into the air. For example, law enforcement could plausibly switch over to lead-safer bullets, which prevent employee exposure to airborne lead, rather than adopt the prescribed protective measures. In industries where this is feasible, this could provide some incentive to innovate as new lead-free methods of production would be sought out and developed. For many occupations, such as employees engaged in paint-removal, working in a lead-free space is likely unavoidable. In such sectors, considerable incentives for innovation from the proposed regulation are not expected.

The new demand for labor and materials created by each compliance action could create an opportunity for new businesses to develop in the state. While some of the new demand will be for products that are imported from outside the state, other requirements present an

opportunity for innovation and new businesses, or the expansion of existing business enterprises, in California. For example, more stringent air monitoring requirements will increase demand for industrial hygienists. The advanced hygiene requirements will increase demand for portable showers and washrooms. The engineering control requirements will increase demand for ventilation systems and their installation. These services are likely to be met by an increase in business activity within the state.

BENEFITS OF THE PROPOSED ACTION

The benefits of the regulation, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, environment and quality of life, and any other benefits identified by the agency.

These proposals would limit workplace exposure to lead and generate benefits in the form of avoided costs associated with morbidity (induced illness) and mortality (shortened life expectancy) caused by occupational lead exposure. Prolonged workplace exposure to lead has been linked to, among other maladies, high blood pressure, cardiovascular disease, impaired kidney function, nervous system and neurobehavioral effects, cognitive dysfunction later in life, cognitive effects associated with prenatal exposure, as well as premature death (EPA, 2013). The effect of these revisions would be to lower the risk that employees exposed to lead will develop these harmful health effects. Benefit categories quantified in the SRIA include all-cause mortality, hypertension, non-fatal heart attack and depression/anxiety.

By lowering workplace exposure to lead, the proposed regulation will also result in reduced "take-home" lead exposure for non-employees, and California society-at-large. When employees are exposed to lead over the course of the workday, lead dust accumulates on their exposed skin, hair, clothing and shoes. In many cases, unless a lead-exposed employee changes clothes and showers prior to returning home, lead dust is transported into their home. The employee's family and other household members are then exposed to elevated levels of lead. Reducing levels of lead exposure in the workplace, and increasing hygiene measures, will therefore also reduce lead exposure to susceptible individuals, including infants, children and individuals of childbearing age. The negative health effects of lead on infants and children are well known, and include developmental delay, neurobehavioral disorders and lowered IQ. Avoiding these negative health effects would have a positive result on society as a whole.

The proposed regulation will also have a positive effect on California's environment. Because the amount of lead used in workplaces is likely to decrease as a result of compliance with the proposed regulation, the amount of lead emitted into the environment is also likely to decrease. A reduction of lead in the environment would also have a positive effect on California's residents, as their exposure to lead and its harmful effects would be reduced.

Methodologies

Assessing and determining the benefits and costs of the proposed regulation, expressed in monetary terms to the extent feasible and appropriate.

Costs to Employers to Comply with Proposed Regulations

The additional costs to employers to comply with the requirements of the proposed revisions to the regulations were calculated. Two types of compliance costs have been calculated: costs that employers must pay on intermediate goods and services (e.g. additional lab tests or engineering controls), and time costs that employers must pay for employees' lost time while undergoing testing, training, MRP, etc. For each affected sector, the total compliance costs in each category of intermediate inputs and labor payments were calculated. As detailed by BEAR in its *Standardized Regulatory Impact Assessment: Revisions to Occupational Lead Standards*, employee exposure levels used in the SRIA for various job classifications were estimated based on exposure modeling using lead exposure data in published literature (BEAR, 2020). Total compliance costs for each affected sector were then calculated by multiplying the number of employees estimated to be exposed to lead at a given level of exposure by the cost per employee to implement the required compliance actions.

Types of Costs Considered for Implementation of the Proposed Regulations

Proposed compliance actions are often specific to particular exposure levels and may not be required for all employers or industries. In general, proposed compliance actions incurring potential costs fall into nine categories: air monitoring, engineering controls, respiratory protection, personal protective equipment, basic hygiene, advanced hygiene, medical surveillance, MRP and training.

While MRP is typically activated by a BLL threshold, the other eight potentially cost-incurring compliance actions depend primarily on employee exposure levels, measured in $\mu g/m^3$. For this cost analysis, employee exposure levels for various job classifications were estimated based on exposure modeling using lead exposure data in published literature.

Under the Construction Safety Orders (Construction[1]), some compliance actions are triggered when an employee conducts trigger tasks, as defined in the proposed standard. Similarly, under the General Industry Safety Orders (General Industry[2]), some compliance actions are triggered when an employee performs PHLW, as defined in the proposed standard. In both cases, these compliance actions are required as interim protection until the employer has conducted an

[1] When used in this document, the word "Construction" refers to work that falls under the scope of the title 8 Construction Safety Orders.
[2] When used in this document, the term "General Industry" refers to work that falls under the scope of the title 8 General Industry Safety Orders.

exposure assessment. However, for both Construction and General Industry, the compliance cost estimates assume the employer has performed the required exposure assessment. Therefore, the required control measures are based on the requirements for the estimated lead exposures of employees who perform trigger tasks or PHLW, rather than on the requirements for interim protection.

Results: Compliance Costs for Public and Private Sector Employers

Total additional direct compliance costs for the proposed regulatory revisions to the occupational lead standards are estimated to be approximately $248.3 million in year 1 of the proposed regulations, and approximately $195.4 million per year in subsequent years.

These costs can be broken down into estimated direct compliance costs for Construction (approximately $104.3 million in year 1; $84.3 million per year in subsequent years), and General Industry (approximately $144 million in year 1; $111.2 million per year in subsequent years).

In Construction, the compliance category with the highest cost is expected to be medical surveillance, estimated at $66.4 million in year 1, and $47.7 million per year in subsequent years. The cost of basic hygiene requirements is estimated to be $12.1 million per year. Other compliance costs for Construction include air monitoring ($4 million in year 1; $2.2 million per year in subsequent years); engineering controls ($6.2 million in year 1; $6.6 million per year in subsequent years); respiratory protection ($3.1 million in year 1; $3.2 million per year in subsequent years); personal protective equipment ($1.2 million per year); advanced hygiene ($6.8 million per year); and training ($4.4 million per year). Compliance costs for MRP in Construction are estimated to be $0.

In General Industry, the compliance category with the highest cost is expected to be advanced hygiene, estimated at $43.4 million per year. The cost of engineering controls is estimated to be $30.4 million in year 1, and $30.9 million per year in subsequent years. Other compliance costs for General Industry include air monitoring ($3 million in year 1; $1.6 million per year in subsequent years); respiratory protection ($943,000 in year 1; $855,000 per year in subsequent years); personal protective equipment ($4.5 million per year); basic hygiene ($22.1 million per year); medical surveillance ($16.2 million in year 1; $4.4 million in subsequent years); MRP ($19.9 million in year 1; $0 in subsequent years); and training ($3.6 million per year).

Benefits: Costs Avoided

These proposals would limit workplace exposure to lead, and generate benefits in the form of avoided costs associated with morbidity (induced illness) and mortality (shortened life expectancy) caused by occupational lead exposure. Prolonged workplace exposure to lead has been linked to, among other maladies, high blood pressure, cardiovascular disease, impaired

kidney function, nervous system and neurobehavioral effects, cognitive dysfunction later in life, cognitive effects associated with prenatal exposure, as well as premature death (EPA, 2013). The effect of these revisions would be to lower the risk that employees exposed to lead will develop these harmful health effects.

Benefits: Monetary Value of Costs Avoided

It is estimated that the monetary benefits of the regulation, due to avoided cases of lead-related illness and premature death, and the costs associated with them, would be $27.9 million at the end of year 1 of the proposed regulation. This value would increase each year, with annual benefits reaching $1.3 billion per year at the end of year 45 of the proposed regulation. The monetary value of benefits increases each year, because the effects of lead exposure are cumulative, so the longer the proposed regulation is in place, the more cases of lead-related illness and premature deaths are avoided each year. Benefit categories quantified in the SRIA include all-cause mortality, hypertension, non-fatal heart attack and depression/anxiety.

The estimate of monetary benefits represents only a fraction of the total potential benefits, as many of the other health benefits likely to accrue from the proposed regulation have not been quantified. Thus, the magnitude of benefits is likely underestimated here.

Additional Benefits: Non-quantified Costs Avoided

The above estimates do not attempt to quantify all monetary benefits from the proposed regulation. While lead exposure is understood to cause additional health damages, studies have not precisely quantified the relationship between cumulative lead exposure and incidence of health damage. Non-quantified health endpoints linked to lead, but without sufficient data to reliably estimate the number of avoided cases, include muscular pain, ocular disorder, nervous system disorder, panic disorder, dementia, male fertility damages and female fertility damages, among others. In addition to the health damages known to be associated with lead that could not be quantified, other health damages are suspected to be associated with lead exposure, including cancer and chronic kidney disease. Avoidance of cases of these conditions would result in additional monetary benefits.

Also, as the number of lead-related health conditions suffered by employees is reduced, employers should experience a decrease in fiscal losses due to work absence, staff replacement, workers' compensation costs and possibly other legal costs.

Assessing the value of nonmonetary benefits, such as the protection of public health and safety, worker safety, or the environment, the prevention of discrimination, the promotion of fairness or social equity, an increase in the openness and transparency of business and government and other nonmonetary benefits is consistent with the statutory policy or other provisions of law.

By lowering workplace exposure to lead, the proposed regulation will also result in reduced "take-home" lead exposure for non-employees, and California society at large. When employees are exposed to lead over the course of the workday, lead dust accumulates on their exposed skin, hair, clothing and shoes. In many cases, unless the employee changes clothes and showers prior to returning home, lead dust is transported to their home. There, the employee's family and other household members are exposed to elevated levels of lead. Reducing levels of lead exposure in the workplace, and increasing hygiene measures, will therefore also reduce lead exposure to susceptible individuals, including infants, children and individuals of childbearing age. The negative health effects of lead on infants and children are well known, and include developmental delay, neurobehavioral disorders and lowered IQ. Avoiding these negative health effects would have a positive result on society as a whole. However, limited information is available regarding the potential magnitude of this additional benefit, so it is not quantified in this analysis.

Another non-monetary benefit of the proposed regulation is the positive effect it is likely to have on California's environment. Because the amount of lead used in workplaces is likely to decrease as a result of compliance with the proposed regulation, the amount of lead emitted into the environment is also likely to decrease. A reduction of lead in the environment would also have a positive effect on California's residents, as their exposure to lead and its harmful effects would be reduced.

Comparing the proposed regulatory alternatives with an established baseline so that agencies can make analytical decisions regarding the adoption, amendment, or repeal of regulations necessary to determine that the proposed action is the most effective, or equally effective and less burdensome, alternative in carrying out the purpose for which the action is proposed, or the most cost-effective alternative to the economy and to affected private persons that would be equally effective in implementing the statutory policy or other provision of law.

Both the direct costs and benefits, as well as the macroeconomic impacts of the proposed regulations, were evaluated in the SRIA relative to a baseline scenario. It was assumed that under the baseline, occupational lead requirements remain as they currently are. For example, the baseline scenario assumes that all employers are in compliance with the current permissible exposure limit of 50 $\mu g/m^3$ and all other requirements of the standards. The costs and benefits associated with the proposed regulation should therefore be interpreted as the incremental costs and benefits associated with lowering the PEL, action level and all the other proposed regulatory changes. For the macroeconomic assessment, the baseline is assumed to follow the California Department of Finance's conforming forecast for the California economy. All macroeconomic results are presented relative to the model baseline that was calibrated to this forecast.

Determining the impact of a regulatory proposal on the state economy, businesses, and the public welfare, as described in subdivision (c) of section 11346.3.

The economy-wide impacts of the revisions to the occupational lead safety regulations were evaluated using the BEAR forecasting model. The BEAR model is a dynamic computable general equilibrium model of the California economy. The model explicitly represents demand, supply and resource allocation across the California economy, estimating economic outcomes over the period 2016 - 2030. For the SRIA, the BEAR model was aggregated to 60 economic sectors.

The current version of the BEAR model was calibrated using 2015 IMPLAN data. Both the baseline and policy scenarios use the Department of Finance conforming forecast from June 2017. The conforming forecast includes official assumptions about future gross domestic product growth for the State's economy and population. The main inputs into the macroeconomic analysis were the sector-specific compliance costs of the proposed regulation over time and the reduction in health expenditures that can be expected as lead-induced health effects decline over time.

Macroeconomic analysis shows the proposed revisions will likely have a negligible impact on the overall California economy, measured in terms of gross state product, employment, real business output and household income. Because lead-exposed employees are spread across diverse work activities, the impacts of the regulation are not concentrated in any particular sector. The exception is in the early years of regulatory implementation, when the construction and manufacturing sectors have high compliance costs, which reduce sectoral output. Even in sectors that show positive net compliance cost in some years, however, the impact is never high enough to reduce absolute output or jobs. All sectors remain growth and employment positive in every year, even if growth is moderated slightly by the need to improve employee health and safety.

Assessing the effects of a regulatory proposal on the General Fund and special funds of the state and affected local government agencies attributable to the proposed regulation.

The Board has determined that the proposals would have no effect on the General Fund and special funds of the state and affected local government agencies.

Determining the cost to the agency and affected business enterprises and individuals of enforcement and compliance.

Enforcement Costs

Cal/OSHA will enforce the proposed regulations and has contemplated the associated cost of enforcement. Cal/OSHA estimates that it may need to conduct approximately 120 additional

inspections per year if, after the proposed regulation becomes effective, all of the following occur:

1. Cal/OSHA is required to or otherwise decides to investigate every case where an employee's blood lead level equals or exceeds 20 µg/dl,
2. 100 percent of covered employers fail to comply with the proposed regulation, and
3. Lead exposures to employees do not decrease.

Although this scenario is highly unlikely, to conduct 120 additional inspections, Cal/OSHA would need an additional four industrial hygienists at a cost of $789,000 in the first year, and $730,000 per year on an ongoing basis.

Costs to Affected Business Enterprises to Comply with Proposed Regulations

The methods used to estimate the additional compliance costs for all employers was described in detail previously. To calculate the cost of compliance for business enterprises in California, first, the number of private sector employees estimated to be exposed to lead at a given level of exposure was determined. This number was then multiplied by the cost per employee to implement the required compliance actions. The compliance costs for business enterprises is estimated to be $228.9 million in year 1 of the proposed regulations, and $183.2 million per year in subsequent years. Breaking this down further, in Construction, the compliance costs for business enterprises is estimated to be $97.6 million in year 1 of the proposed regulations, and $78.8 million per year in subsequent years. In General Industry, the compliance costs for business enterprises is estimated to be $131.4 million in year 1 of the proposed regulations, and $104.3 million per year in subsequent years.

Making the estimation described in Government Code section 11342.548.

A regulation is determined to be a major regulation if the estimated economic impact of the regulation is expected to exceed $50 million per year once fully implemented. For the lead standards being considered, both the direct compliance costs and direct benefits of the proposed regulation are independently expected to exceed this threshold. Direct compliance costs are estimated to be approximately $228.9 million per year in year 1 and $183.2 million per year in subsequent years. Direct benefits are estimated to range from $27.9 million in year 1, increasing to $1.26 billion per year by year 45, when the full effect of the proposed revisions is realized. Therefore, revisions to the occupational lead regulations for Construction and General Industry in California qualify as a major regulation, well above the $50 million threshold requiring a complete SRIA.

EVIDENCE SUPPORTING FINDING OF NO SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING BUSINESSES

The Board has made an initial determination that this proposal will not result in a significant, statewide adverse economic impact directly affecting businesses/individuals, including the ability of California businesses to compete with businesses in other states. Many of the businesses in the sectors that are most affected by the proposed regulations (for example, construction, firing ranges, security firms and scrap metal recycling) are not particularly susceptible to competition from outside of the state, since their work must be performed in California. All firms engaging in these activities are therefore subject to the proposed regulations. BEAR concluded in its SRIA that California firms are not expected to be at a competitive disadvantage due to the new regulations (BEAR, 2020).

REASONABLE ALTERNATIVES TO THE PROPOSAL AND REASONS FOR REJECTING THOSE ALTERNATIVES

Alternative 1: More stringent regulatory alternative.

One alternative considered was more stringent than the proposal. In this alternative, the PEL would be set at 2 μg/m^3, rather than the proposed level of 10 μg/m^3. This change would both increase the compliance costs for regulated entities and potentially increase employee benefits by reducing even low-level occupational exposure to lead.

Under the more stringent regulatory alternative, with a lower PEL, the total compliance costs for Construction employers would be higher than the compliance costs under the proposed regulation. This is due to the fact that Cal/OSHA's exposure modeling indicates that most employees in Construction have exposure levels less than 10 μg/m^3 lead, so a lower PEL would capture many additional employees and therefore increase costs. Costs increase from $104 million (year 1) and $84 million (year 2+) under the proposed regulation, to $160 million (year 1) and $126 million (year 2+) under the more stringent alternative with the lower PEL. In General Industry, the compliance costs would nearly double, from $144 million (year 1) and $111 million (years 2+) under the proposed regulation, to $281 million (year 1) and $203 million (years 2+) with the lower PEL. This increase in compliance costs is driven mainly by the cost of more stringent control requirements that would have to be adopted for thousands of law enforcement employees by their employers, as compared to the proposed regulatory changes.

Reducing the permissible exposure limit to 2 μg/m^3 would generate all of the same benefits as reducing the permissible exposure limit to 10 μg/m^3, as well as further benefits from the additional reduction below 10 μg/m^3. The benefits of reduction below 10 μg/m^3 depend on the health risks of low-level lead exposure, and these remain unclear. While exposure to small amounts of lead was previously thought to present minimal health risk, recent evidence suggests that even low-level lead exposure may increase the risk of cardiovascular disease

mortality. While this new finding suggests substantial benefits would result from the additional reduction in exposure, most studies do not attempt to quantify the magnitude of health benefits from reductions in exposure at these levels.

The costs of this alternative are significantly higher than the proposal, while the amount of increase in benefits is not known. For these reasons, adopting this more stringent alternative is rejected.

Alternative 2: Less stringent regulatory alternative.

A second alternative considered was less stringent than the proposal. In this alternative, Construction employers would be required to provide employees exposed at > 500 µg/m^3 with a BLL test every two months, after the first year of the regulation, rather than the proposed requirement of a BLL test every month. Medical surveillance is the main source of costs of the proposed regulation, thus reducing the testing interval would decrease compliance costs for Construction employers.

Under the less stringent regulatory alternative, with BLL tests required to be provided to Construction employees exposed >500 µg/m^3 every two months, compliance costs for Construction employers would be reduced, for years 2+ of the regulation, from $48 million under the proposal to $25 million under this alternative. This is based on Cal/OSHA's estimate that approximately 15,400 lead-exposed Construction employees in California are exposed at levels above 500 µg/m^3.

While the less stringent regulatory alternative would potentially save employers in terms of lost employee time and testing expenditures, this alternative would result in less effective control of employees' exposure to lead. The proposed standards are aimed at maintaining all employees' BLLs below 10 µg/dl. In this group of employees, exposures can be much higher than 500 µg/m^3; the original standard is based on data showing exposures to this group of employees can exceed 30,000 µg/m^3 during abrasive blasting activities. In addition, high airborne exposures mean that surface contamination is significant, and therefore the potential for lead exposure due to inadvertent ingestion is also high.

This alternative would likely result in undetected BLL rises among the employees most highly exposed to lead. As such, it would be significantly less protective than the proposal. Undetected increases in employees' BLLs would likely result in additional cases of adverse health outcomes, including hypertension, cardiovascular disease, nervous system and neurobehavioral effects, and impaired kidney function. As a result, the amount of benefits generated in the form of avoided costs associated with these diseases would be reduced. While it is not possible to quantify the magnitude of additional cases of adverse health outcomes and the resulting reduction in monetary benefits, it could be substantial.

In addition, projected savings would be reduced, if not eliminated, if more employees were placed on costly MRP as a result of less frequent blood testing. The current proposal mandates MRP at a single BLL of 30 µg/dl (or at multiple BLLs over 20 µg/dl). Keeping employees below these BLLs in high exposure trades will require strict controls, diligently adhered to, and carefully monitored. Less frequent BLL testing would mean it would be less likely that a rapidly rising BLL would be detected before the MRP criteria are met. MRP is expensive; it requires the removal of an employee from lead work, maintenance of salary and benefits, and significant medical costs. It is quite likely that any savings gained from less frequent BLL testing would be lost to increased MRP costs.

The savings of this alternative are questionable, and the costs in terms of additional adverse health effects are likely significant. For these reasons, adopting this less stringent alternative is rejected.

CONSIDERATION OF A PERFORMANCE STANDARD AND REASON FOR USING A PRESCRIPTIVE STANDARD

The Board considered a performance standard as an alternative to the proposed standard. However, to enable compliance and be effective, the permissible exposure limit and other levels must be clearly prescribed. These levels trigger additional requirements, including requirements to take specific actions and follow specified procedures. Specifying the requirements are essential for the standard to be effective and for effective enforcement of this standard.