

SUMMARY OF CAL/OSHA'S GENERAL INDUSTRY LEAD STANDARD

TITLE 8, CALIFORNIA CODE OF REGULATIONS, SECTION 5198

The following is a summary of the key elements of the Lead Standard for general industry [Title 8, California Code of Regulations, Section 5198]. It is presented as an aid to understanding the Standard. It is not a complete discussion of all the requirements of the Lead Standard. If you would like a copy of the complete Standard, call the Occupational Lead Poisoning Prevention Program, California Department of Health Services at (510) 622-4332.

Contents

▶ Scope of the Standard	1
▶ Exposure Limit (Permissible Exposure Limit)	1
▶ Action Level	1
▶ Exposure Monitoring	1
▶ Compliance Program	3
▶ Mechanical Ventilation (Local Exhaust Ventilation)	4
▶ Respiratory Protection	4
▶ Protective Work Clothing and Equipment	6
▶ Housekeeping	6
▶ Hygiene Facilities and Practices	6
▶ Medical Surveillance (Lead Medical Program)	7
▶ Medical Removal Protection	10
▶ Employee Information and Training	10
▶ Signs	11
▶ Record Keeping	11

SCOPE

The General Industry Lead Standard applies to all occupational exposures to lead with the exception of the construction industry and the agricultural industry. (Requirements concerning exposure to lead in the construction industry can be found in Title 8, CCR, Section 1532.1, the Construction Lead Standard, and are not discussed here.)

[reference: 5198(a)]

EXPOSURE LIMIT

Permissible Exposure Limit. The Permissible Exposure Limit (PEL) for lead is 50 micrograms of lead per cubic meter of air ($50 \mu\text{g}/\text{M}^3$) as an 8-hour average. If the work day is longer than 8 hours, the permissible exposure limit is equal to $400 \mu\text{g}/\text{M}^3$ divided by the number of hours worked that day.* **Employers must control exposure so that no employee is exposed to lead at concentrations over the PEL.** If personal air monitoring shows air lead levels above the PEL, certain requirements of the Lead Standard are triggered. These requirements are described below and in the diagram on page 2.

[reference: 5198(c)]

ACTION LEVEL

Action Level. The Lead Standard also establishes an air lead level called the Action Level (AL). The AL is 30 micrograms of lead per cubic meter of air ($30 \mu\text{g}/\text{M}^3$) as an 8-hour average. If personal air monitoring shows air lead levels at or above the AL, certain requirements of the Lead Standard are triggered. These requirements are described below in the diagram on page 2.

[reference: 5198(b)]

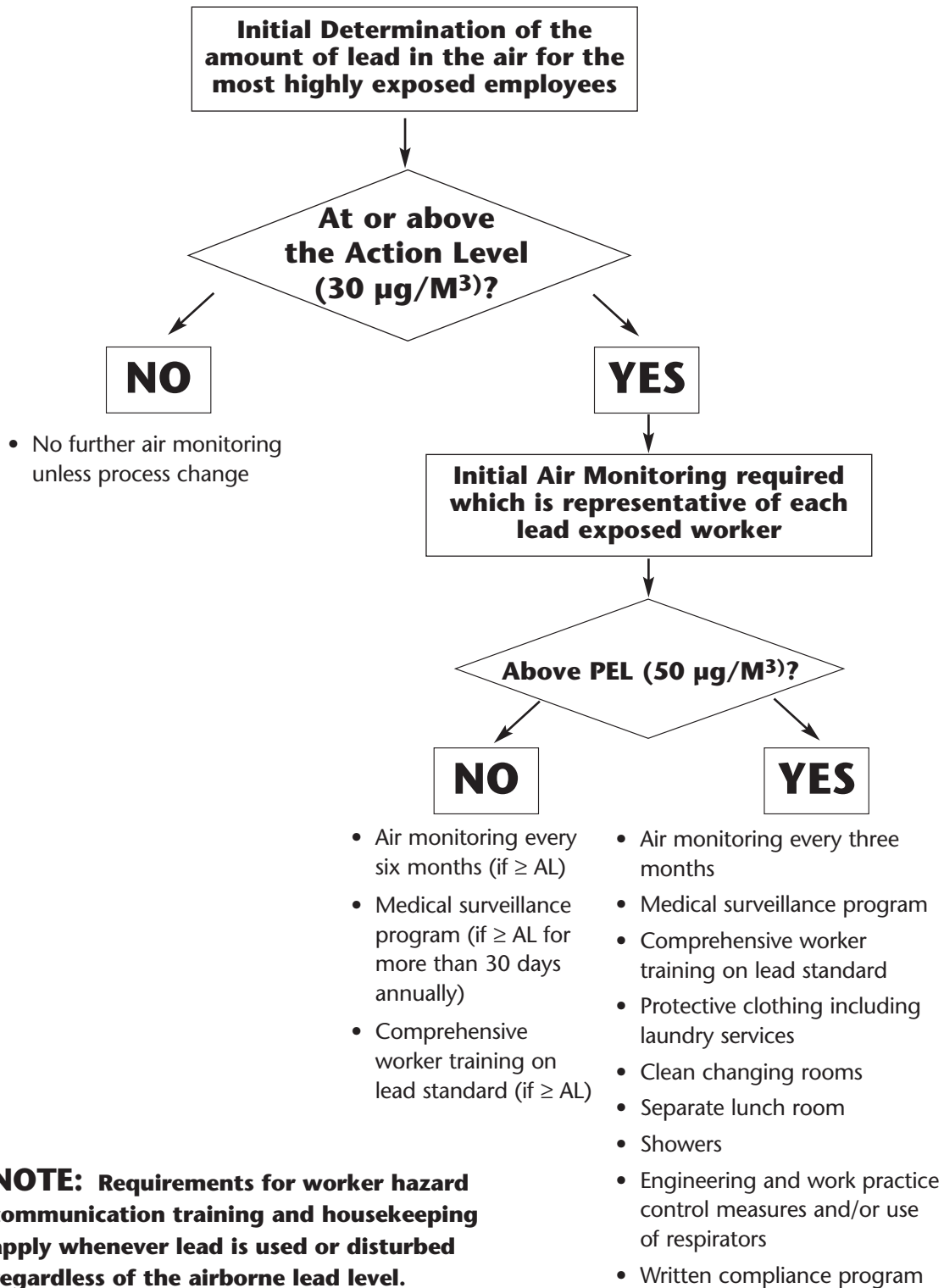
EXPOSURE MONITORING

Initial Determination. If any lead is used in the workplace, the employer must measure the amount of lead in the air for a representative number of employees who are reasonably believed to have the highest exposure levels. The purpose of this initial determination is to find out whether air lead levels are above the Action Level. The employer must collect full-shift, personal samples in the employee's breathing zone. Depending on the results of the initial determination, employers may have additional responsibilities. See diagram on the following page.

Initial Monitoring. If the initial determination is less than the AL ($30 \mu\text{g}/\text{M}^3$), no further assessment is needed until there has been a change of equipment, process, control, personnel or a new task has been initiated. If the initial determination is above the AL, the employer must conduct monitoring which is representative of each

*e.g., If an employee is required to work 10 hours in a day, the PEL is reduced to $40 \mu\text{g}/\text{M}^3$ ($400 \mu\text{g}/\text{M}^3$ divided by 10 equals $40 \mu\text{g}/\text{M}^3$).

LEAD STANDARD REQUIREMENTS TRIGGERED BY AIRBORNE EXPOSURE MONITORING



employee in the workplace who is exposed to lead. This means that the employer must conduct personal air monitoring for each job classification and each shift where lead may be present.

Periodic Exposure Monitoring. If the initial monitoring is above the PEL, then monitoring must be done quarterly. If the initial monitoring is below the PEL but above the AL, monitoring must be done at least every six months.

Employee Notification. The employer must notify employees in writing of the results of personal air monitoring within 5 working days of receiving the results. If air lead levels are above the PEL, the employer must also include a written notice telling employees that the air lead levels exceeded the PEL and describing the corrective action the employer has taken or will take to reduce exposure to or below the legal limit.

[reference: 5198(d)]

COMPLIANCE

Methods. If personal air monitoring shows that air lead levels are above the PEL for more than 30 days per year, the employer must implement all feasible engineering, work practice, and administrative controls to reduce air lead levels to below the PEL.

When all feasible controls are in place and are still insufficient to reduce air lead levels below the PEL, respirators must also be used to reduce employee exposure so that no employee is exposed above the PEL on any day.

Written Compliance Program. Employers must establish and implement a written compliance plan to reduce air lead levels to or below the PEL by means of engineering and work practice controls whenever air lead levels are above the PEL for 30 days or more per year. This plan must be in writing and must be revised at least every 6 months. The plans must include at a minimum:

- Description of each operation in which lead is emitted.
- Description of the specific means that will be used to achieve compliance.
- Report of the technology considered in meeting the PEL.
- Air monitoring data which documents the source of lead emissions.
- Detailed schedule for implementation of the program.
- Work practice program.
- Administrative control schedule, if applicable.

[reference: 5198(e)]

MECHANICAL VENTILATION

When mechanical ventilation is used to control exposure, measurements which demonstrate that the system is effective in controlling lead exposure must be made at least every 3 months. Measurements of the system's effectiveness in controlling exposure must be made within 5 days of any change in production, process, or control which might result in a change in employee exposure to lead. Measurements may include capture velocity, duct velocity and/or static pressure.

[reference: 5198(e)]

RESPIRATORY PROTECTION

Respiratory protection must be used:

- When engineering, administrative and work practice controls are insufficient to reduce exposure to or below the PEL.
- During the time period necessary to implement feasible engineering, work practice, and other controls.
- Whenever an employee requests a respirator.

If respiratory protection is used, employers must:

- Select respirators based on the results of air monitoring data representative of an employee's exposure and in accordance with Table 1: *Respiratory Protection for Lead Aerosols*. See page 5.
- Provide respirators at no cost to the employee.
- Provide a medical examination to any employee who has difficulty breathing while wearing a respirator.
- Have a written respiratory protection program in compliance with Title 8, CCR, Section 5144, that includes respirator training and provision of fit testing initially and at least annually after that.

[reference: 5198(f)]

Table 1
RESPIRATORY PROTECTION FOR LEAD AEROSOLS

Airborne Concentration of Lead* or Condition of Use	REQUIRED RESPIRATOR ¹
Not in excess of 500 µg/M ³ (10 X PEL)	Half-mask, air-purifying respirator equipped with high efficiency filters ^{2, 3} .
Not in excess of 2500 µg/M ³ (50 X PEL)	Full facepiece, air-purifying respirator with high efficiency filters ³ .
Not in excess of 50,000 µg/M ³ (1000 X PEL)	Any powered, air-purifying respirator with high efficiency filters ³ ; or Half-mask supplied-air respirator operated in positive-pressure mode. ²
Not in excess of 100,000 µg/M ³ (2000 X PEL)	Supplied-air respirators with full facepiece, hood, helmet, or suit operated in positive-pressure mode.
Greater than 100,000 µg/M ³ , unknown concentration, or fire fighting.	Full facepiece, self-contained breathing apparatus operated in positive-pressure mode.

***NOTE:** We have presented these concentrations in micrograms per cubic meter of air (µg/M³). The Cal/OSHA Standard presents the same information in milligrams per cubic meter (mg/M³).

¹Respirators specified for high concentrations can be used at lower concentrations of lead.

²Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.

³A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles. (Note: Filters designated P-100, R-100 or N-100 meet this definition).

PROTECTIVE WORK CLOTHING AND EQUIPMENT

Whenever personal air monitoring shows that air lead levels are above the PEL, the employer must:

- Provide, at no cost to the employee, appropriate protective work clothing and equipment such as coveralls or other full-body clothing, gloves, hats, shoes, etc.
- Provide the protective clothing in a clean and dry condition at least weekly. Clothing must be provided daily to workers who work in areas where air lead levels exceed 150 µg/M³.
- Provide for cleaning, laundering, or disposal of protective clothing and equipment.
- Repair or replace protective clothing and equipment as necessary.
- Assure that employees use appropriate protective clothing and equipment, remove contaminated work clothing at the end of the shift, and place it in a closed labeled container. The container must be labeled as follows: CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD-CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.
- Prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.
- Inform, in writing, any person who cleans or launders protective clothing or equipment of the potential harmful effects of lead.

[reference: 5198(g)]

HOUSEKEEPING

All surfaces shall be maintained free of accumulated lead. Compressed air may not be used to clean floors or other surfaces of accumulated lead. Vacuums equipped with toxic dust removing HEPA filters must be used to clean surfaces of accumulated lead unless they are found to be ineffective.

[reference: 5198(h)]

HYGIENE FACILITIES AND PRACTICES

Whenever personal air monitoring shows air lead levels above the PEL, the employer must:

- Prohibit eating, drinking, smoking, use of other tobacco products, and applying of cosmetics in areas where air lead levels exceed the PEL.

- Prohibit storage of food or tobacco products in areas where air lead levels exceed the PEL.
- Provide a clean change room with separate storage facilities for work clothing and equipment and for street clothing to prevent cross contamination with lead.
- Provide shower facilities and assure that employees shower at the end of the work shift.
- Assure that employees do not leave the workplace wearing any contaminated clothing or equipment.
- Provide accessible lunch room facilities with a filtered air supply.
- Assure that employees wash their hands and face prior to eating, drinking, smoking or applying cosmetics.
- Assure that employees do not enter lunchroom facilities with protective clothing and equipment unless surface lead dust has been removed by HEPA vacuuming, down-draft booth, or other cleaning method.

[reference: 5198(i)]

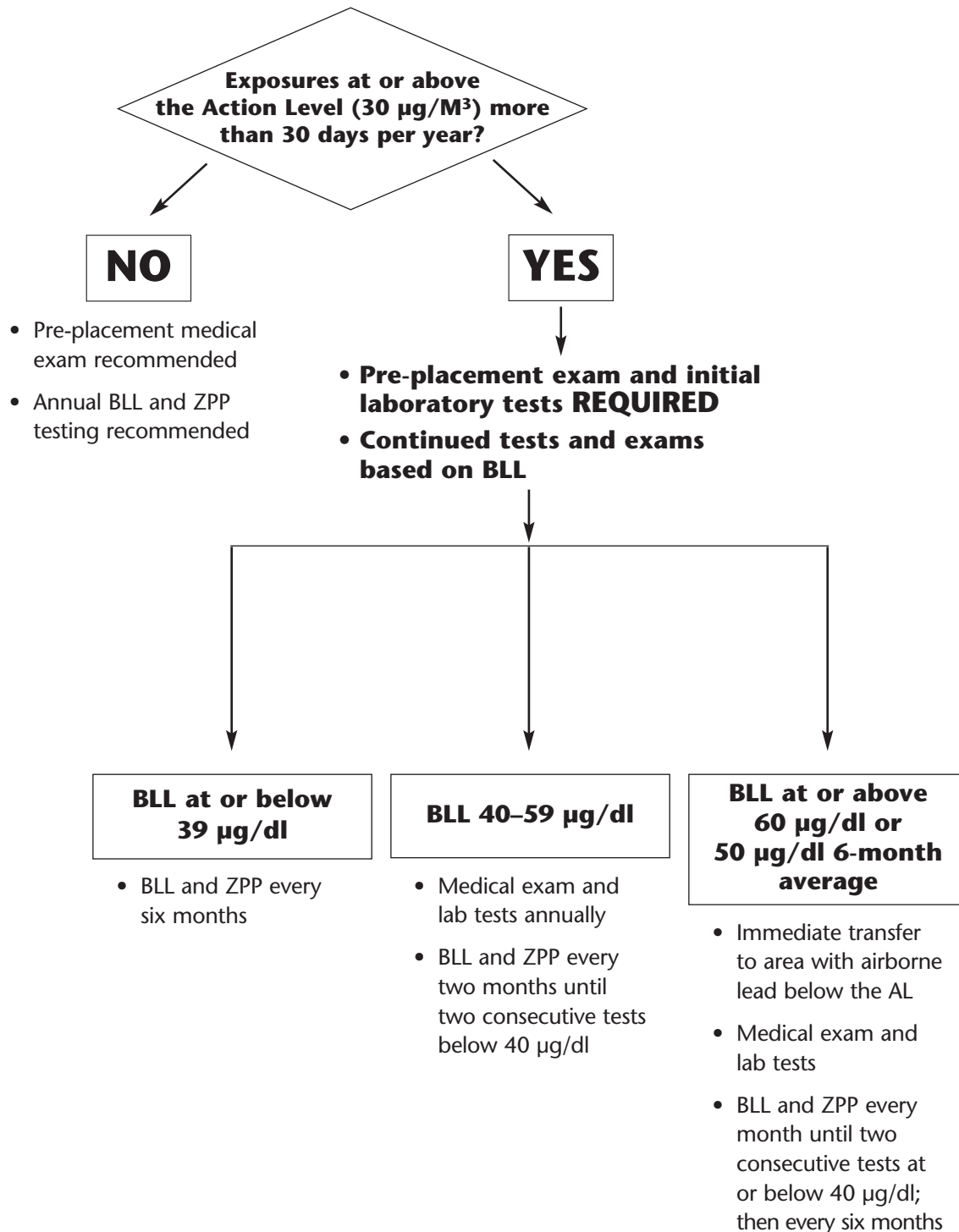
MEDICAL SURVEILLANCE (See diagram on the following page)

All employees for whom personal air monitoring shows that air lead levels are at or above the AL for more than 30 days per year must be enrolled in a medical surveillance program. This program must be instituted by the employer and supervised by a licensed physician. The employer must provide the required medical surveillance without cost to the employee. The employer must provide the physician supervising the program with:

- Copy of the General Industry Lead Standard.
- Description of what exposed employees do.
- Description of the type of respirator or other protective equipment which will be used, if any.
- Results of any air monitoring for lead.
- Any prior BLL or ZPP test results.

Biological Monitoring. The employer must make blood lead and zinc protoporphyrin testing available to each employee for whom personal air monitoring has shown that air lead levels are at or above the AL for 30 or more days per year. See diagram on following page for frequency of testing requirements.

KEY MEDICAL SURVEILLANCE REQUIREMENTS



Blood lead testing must be conducted by an OSHA approved analytical laboratory. All employees should receive written notification of the results of their BLL test. Employers must notify in writing, within five working days of receiving the results, each employee whose BLL is at or above 40 µg/dl. This written notification must include the employee's blood lead level and information on the medical removal protections of the Standard. OLPPP has developed forms for notifying employees of BLL and ZPP test results. Call (510) 622-4332 to get free copies.

Medical Examinations. The employer must make available medical examinations and consultations to each employee:

- Prior to assignment to an area or task where personal air monitoring shows air lead levels are at or above the AL.
- At least annually for each employee with a BLL at or above 40 µg/dl within the last 12 months.
- Upon notification that an employee has signs or symptoms of lead poisoning or has had difficulty breathing during respirator use.
- At the request of an employee who desires medical advice on the reproductive effects of lead.

A complete medical exam includes:

- Medical and work history (with attention to past and present lead exposure).
- Physical exam (with attention to body systems affected by lead).
- Laboratory tests (BLL and ZPP tests, blood tests for anemia and kidney function, urinalysis, and lung function if a respirator is used).
- Any other tests the physician determines are necessary.
- Pregnancy testing or laboratory evaluation of male fertility if requested by the employee.

An employee is entitled to a second medical opinion, at the expense of the employer, regarding the lead medical examination. The employer must notify the employee of the right to seek a second medical opinion after each medical examination required by this section. The employee has the right to choose the second physician. If necessary, a third physician designated by the employer and the employee resolves disagreement between the first two.

Chelation. The use of chelation therapy** to prevent employees' BLLs from rising is strictly prohibited. The employer must make sure that no one that he employs, supervises, or controls uses preventive chelation at any time.

The use of chelation therapy to treat a lead poisoned employee must be done under the supervision of a licensed physician. Only a licensed physician may make decisions regarding an individual employee's care and treatment.

[reference: 5198(j)]

MEDICAL REMOVAL PROTECTION

Employers must remove an employee from an area or task where personal air monitoring shows air lead levels are at or above the Action Level when the individual's BLL level is at or above 60 µg/dl; when the average of the last 3 BLL tests is at or above 50 µg/dl; or, when the average of all BLLs over the previous 6 months is at or above 50 µg/dl. After two consecutive BLLs are 40 µg/dl or lower, the employer can return the employee to the previous work if the medical supervisor recommends it.

Employers must also remove an employee when a physician decides that the employee has a medical condition that places the employee at greater risk of health damage from lead exposure. The employee may be returned to work when the physician determines that the employee no longer has a medical condition which places him or her at greater risk.

The Standard requires that the employer continue to pay the employee his/her regular salary during the removal period (up to 18 months) and maintain seniority and benefits. The physician may allow a temporarily removed employee to work in an area or task where personal air monitoring shows air lead levels below the AL. If no such work is available, the employee must be temporarily off work and the employer must continue to pay the employee's full salary and maintain his/her benefits.

[reference: 5198(k)]

EMPLOYEE INFORMATION AND TRAINING

The employer must provide training to each employee prior to an initial assignment to a job with lead exposure. All employees exposed to lead must receive:

- Information on lead hazards contained in Appendices A and B of the Lead Standard.

**Drug treatment to remove lead from the blood.

When personal air monitoring shows air lead levels at or above the AL, or where employees may have eye or skin irritation from exposure to lead, the employer must train employees at least annually on:

- Content of this Standard.
- Nature of operations which result in lead exposure.
- Purpose, selection, fitting, use, cleaning and limitations of respirators.
- Purpose and description of medical surveillance and medical removal protection.
- Engineering controls and work practices used to reduce exposure.
- Contents of any compliance plan.
- Prohibition on the use of chelating agents to prevent BLLs from rising.

The employer must make a copy of the General Industry Lead Standard and its appendices available to any employee exposed to lead.

[reference: 5198(l)]

SIGNS

In work areas where personal air monitoring shows air lead levels are greater than the PEL, the employer must post and maintain a warning sign with the words: WARNING–LEAD WORK AREA–POISON–NO SMOKING OR EATING. To request a warning sign that complies with this provision, call OLPPP at (510) 622-4332.

[reference: 5198(m)]

RECORD KEEPING

Employers are required to maintain detailed records on exposure monitoring, medical surveillance, and medical removals. The employer must maintain exposure monitoring and medical surveillance records for at least 40 years or for the duration of employment plus 20 years, whichever is longer. The employer must maintain medical removal records at least for the duration of an employee's employment. Employers must make exposure monitoring, medical surveillance, and medical removal records available to employees upon request.

[reference: 5198(n)]