



## ***Administrative Procedure***

# **PRC-PRO-SH-40498**

# **Occupational Lead Exposure Control**

**Revision 0, Change 0**

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**Project: CH2M HILL Plateau Remediation Company  
Topic: Occupational Safety & Industrial Hygiene**

**Administrative Use**

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Rev 0-0: Converting an existing RD (PRC-RD-SH-12389) into a procedure.

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**1.0 INTRODUCTION****1.1 Purpose**

This procedure provides direction for controlling exposures to lead in accordance with Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 or 29 CFR 1910.1025.

**1.2 Scope**

The OSHA lead standards and this program apply to metallic lead, all inorganic lead compounds and lead soaps. Excluded from coverage are all other organic lead compounds. See Appendix A for information regarding typical lead containing materials/compounds, activities which may result in employee exposure to lead or lead compounds and the types of operation covered by the lead Construction standard (29 CFR 1926.62).

For any given operation or activity, either the OSHA *Lead* general industry standard (29 CFR 1910.1025) or the OSHA *Lead* construction standard (29 CFR 1926.62) applies. Both cannot apply at the same time to the same activity. Line management, supported by the project/facility Occupational Safety and Industrial Hygiene (OS&IH) professional, should categorize operations and activities as either construction or general industry during the work planning process.

**1.3 Applicability**

This procedure applies to all CHPRC team members.

**1.4 Implementation**

This procedure is effective on the date published.

**2.0 RESPONSIBILITIES****2.1 Lead Competent Person**

Lead Competent Persons shall:

- Conduct oversight/inspections of lead work as required by Lead Compliance Plans

**2.2 Occupational Safety & Industrial Hygiene (OS&IH) Professionals**

OS&IH Professionals shall:

- Complete the *CHPRC Lead Compliance Plan* (Site Form A-6004-746)
- Communicate applicable requirements to line management during the work planning process
- Determine which OSHA standard is applicable to a given work activity

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**2.3 Human Resources**

Human Resources shall:

- Assist line management and the Occupational Lead Exposure Control Technical Authority (TA) in ensuring that medical removal benefits are properly administered in accordance with the applicable OSHA regulation
- Coordinate with line management, Occupational Lead Exposure Control TA and the Site Occupational Medical provider whenever an employee exhibits signs or symptoms of lead overexposure

**2.4 Line Management**

Line management shall:

- Ensure that the potential exposures of employees are adequately documented in each employee's Employee Job Task Analysis (EJTA)
- Coordinate with Human Resources, the Occupational Lead Exposure Control Technical Authority (TA), and the Site Occupational Medical Provider whenever an employee exhibits signs or symptoms of lead overexposure.
- Ensure that the requirements of the compliance plans are adequately implemented during lead activities.

**2.5 Occupational Lead Exposure Control Technical Authority (TA)**

The Occupational Lead Exposure Control TA shall:

- Assist line management and human resources in ensuring that medical removal benefits are properly administered.
- Determine whether job rotation is an appropriate administrative control.
- Determine whether the use of launderable coveralls is appropriate in areas where employee exposure exceeds the permissible exposure limit (PEL).

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### 3.0 PROCESS

#### 3.1 Permissible Exposure Limit & Action Level

The permissible exposure limit (PEL) is 50  $\mu\text{g}/\text{m}^3$  8-hr time weighted average (TWA). For extended shifts an adjusted PEL shall be calculated using the following formula:

$$\text{PEL (in } \mu\text{g}/\text{m}^3) = 400/\text{hours worked in the day}$$

The action level (AL) is 30  $\mu\text{g}/\text{m}^3$  8-hr time weighted average (TWA). While the AL isn't normally adjusted for extended shifts, the PEL shall also be the AL in those cases where the PEL is lower than the AL.

#### 3.2 Determination of Appropriate OSHA Regulation

While the majority of the requirements in 29 CFR 1910.1025 and 29 CFR 1926.62 are the same, there are certain requirements that are specific to Construction or General Industry.

Actionee	Step	Action
Line Management	1.	NOTIFY the OS&IH professional during the work planning process of the potential for lead exposure.
OS&IH Professional	2.	DETERMINE whether the standard for Construction (29 CFR 1926.62) or General Industry (29 CFR 1910.1025) applies. <ol style="list-style-type: none"> <li>a. Construction work is defined as construction, alteration or repair, including painting and decorating. This includes:               <ol style="list-style-type: none"> <li>1) Demolition or salvage of structures where lead or materials containing lead are present</li> <li>2) Removal or encapsulation of materials containing lead</li> <li>3) New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead</li> <li>4) Installation of products containing lead</li> <li>5) Lead contamination/emergency cleanup</li> <li>6) Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed</li> <li>7) Maintenance operations associated with the construction activities described above</li> </ol> </li> </ol>

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Actionee	Step	Action
OS&IH Professional	b.	All other activities are governed by the General Industry standard.

## 3.3 Hazard Identification and Documentation

## 3.3.1 Initial Determination

Actionee	Step	Action
OS&IH Professional	1.	<p>DETERMINE if sample data exists that may be used to make the initial determination. To use previously collected sample data to make the initial determination, the sample data must have been obtained within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations.</p> <p>a. <u>IF</u> appropriate sample data isn't available, <u>THEN</u> GO TO step 2.</p> <p>b. <u>IF</u> appropriate sample data is available, <u>THEN</u> GO TO step 4.</p>
	2.	IDENTIFY the exposed employees who are identified as likely to be exposed to the greatest airborne concentrations of lead in the workplace.
	3.	MONITOR a representative sample of the exposed employees who are identified as likely to be exposed to the greatest airborne concentrations of lead in the workplace.

**NOTE:** *Where objective data (such as described in Appendix B) demonstrating that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing, use, or handling, initial monitoring is not required.*

4. CONDUCT an initial determination (exposure assessment) to determine the potential for employee exposure to lead. The initial determination shall be based on the employee exposure monitoring results and any of the following relevant considerations:
  - a. Any information, observations, or calculations which would indicate employee exposure to lead
  - b. Any previous measurements of airborne lead

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OS&IH Professional	c.	Any employee complaints of symptoms which may be attributable to exposure to lead
	5.	DETERMINE if any employee may be exposed at or above the either the AL or the PEL. <ul style="list-style-type: none"> <li>a. If no employees have the potential to be exposed above the AL, no further sampling is required.</li> <li>b. If any employee may be exposed above the AL but below the PEL, representative sampling must be conducted at least every six months.</li> <li>c. If any employee may be exposed above the PEL, representative sampling must be conducted at least every three months.</li> </ul>
	6.	DOCUMENT the results of the initial exposure assessment. The documentation shall include a summary of all of the information involved in steps 1 – 4, including a summary of all sampling data.

## 3.3.2 Protection of Employees During Exposure Assessment

Until an exposure assessment is performed and documented that the employee performing any of the listed tasks is not exposed above the PEL, supervision must treat employees as if they were exposed above the PEL while performing the listed lead related tasks, where lead is present. This means providing interim protection including appropriate work practices, respiratory protection, protective work clothing and equipment, change areas, hand washing facilities, biological monitoring, and training.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
OS&IH Professional	1.	DETERMINE if lead containing coatings or paint are present and will be disturbed. <u>IF</u> they are, <u>THEN</u> ;
	2.	IDENTIFY the methods that will disturb the coatings or paint.
	3.	DETERMINE if applicable sample data is available. <ul style="list-style-type: none"> <li>a. <u>IF</u> sample data is available, <u>THEN</u> DOCUMENT sample data as part of the lead compliance plan on site form A-6004-746.</li> </ul>



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<b>Actionee</b>	<b>Step</b>	<b>Action</b>
OS&IH Professional	b.	<p><u>IF</u> sample data isn't available, <u>THEN</u> COMPLETE an interim compliance plan on site form A-6004-746 until exposure monitoring can be conducted. The interim plan shall require:</p> <ol style="list-style-type: none"> <li>1) Personal protective equipment</li> <li>2) Respiratory protection (in accordance with the requirements of Table 1 in Section 3.4.5)</li> <li>3) Change areas</li> <li>4) Hand washing facilities</li> <li>5) Medical monitoring</li> <li>6) Lead worker training</li> </ol>

### 3.3.3 Additional Exposure Assessments

Whenever there has been a change of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the action level or may result in employees already exposed at or above the action level being exposed above the PEL, another exposure assessment shall be conducted in accordance with Section 3.3.1.

### 3.4 Compliance Plan

Compliance plans are required for all work subject to the requirements of 29 CFR 1926.62 (as determined in Section 3.1) and for any work subject to the requirements of 29 CFR 1910.1025 that has the potential for employee exposures to exceed the PEL. The requirements identified during the completion of Section 3.4.1 – 3.4.6 are to be documented on the compliance plan.

<b>Actionee</b>	<b>Step</b>	<b>Action</b>
OS&IH Professional	1.	<p>DETERMINE if a compliance plan is necessary.</p> <ul style="list-style-type: none"> <li>• <u>IF</u> YES, <u>THEN</u> GO TO step 2.</li> <li>• If NO, no further action is required in this section.</li> </ul>
	2.	COMPLETE site form A-6004-746 or its equivalent.

**NOTE:** Alternatives to site form A-6004-746 may be used to document the compliance plan so long as all of the information required on site form A-6004-746 is included.

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Actionee	Step	Action
OS&IH Professional	3.	SUBMIT the form to Line Management for review and approval.
Line Management	4.	REVIEW the submitted form. <ul style="list-style-type: none"> <li>• <u>IF</u> the form information is correct, <u>THEN</u> APPROVE the form.</li> <li>• <u>IF</u> changes are required, <u>THEN</u> COORDINATE with the OS&amp;IH Professional to resolve any issues.</li> </ul>

**NOTE:** *The OS&IH Professional may repeat steps 1 – 3 as necessary to resolve any issues with the compliance plan.*

## 3.4.1 Ventilation

Actionee	Step	Action
OS&IH Professional	1.	IDENTIFY any work activities that require the use of ventilation systems to reduce employee exposure.
	2.	SPECIFY on the compliance plan any ventilation system requirements. Examples include containment structures, exhaust-ventilated tools, and dust collection systems.
	3.	SPECIFY on the compliance plan any containment systems required to facilitate the use of ventilation systems or to reduce the spread of contamination.

## 3.4.2 Job Rotation

If a project intends to use job rotation as a means of reducing employees' TWA exposure to lead, controls are required to ensure that it is properly implemented.

Actionee	Step	Action
Line Management	1.	CONTACT the Occupational Lead Exposure Control Technical Authority to determine if job rotation is an appropriate control.
Occupational Lead Exposure Control TA	2.	DETERMINE if job rotation is an appropriate control:
Line Management		<ul style="list-style-type: none"> <li>• <u>IF</u> YES, <u>THEN</u> COMPLETE step 3.</li> </ul>

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Occupational Lead Exposure Control TA		<ul style="list-style-type: none"> <li>• <u>IF</u> NO, <u>THEN</u> COMMUNICATE that the compliance plan must explicitly prohibit job rotation.</li> </ul>
Line Management	3.	<p>ENSURE that the following information is recorded for all employees who are using administrative controls as a means of reducing exposure:</p> <ul style="list-style-type: none"> <li>• Name or identification number of each affected employee</li> <li>• Duration and exposure levels at each job or work station where each affected employee is located</li> <li>• Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead</li> </ul>

## 3.4.3 Protective Work Clothing &amp; Equipment

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
OS&IH Professional	1.	<p>REQUIRE protective work clothing and equipment in the compliance plan skin protection whenever:</p> <ul style="list-style-type: none"> <li>• Interim measures in accordance with Section 3.3.2 are required</li> <li>• Employee exposures are above the PEL</li> <li>• Employees are exposed to lead compounds that may cause skin irritation (i.e. lead arsenate, lead azide)</li> </ul>
	2.	<p>Protective work clothing may include (but is not limited to):</p> <ul style="list-style-type: none"> <li>• Disposable coveralls or similar full-body work clothing</li> <li>• Gloves, hats, and shoes or disposable shoe coverlets</li> <li>• Face shields, vented goggles, and safety glasses</li> </ul>
	3.	<p>SPECIFY that only disposable coveralls are to be used in the areas identified in step 1 unless specific permission has been obtained from the Occupational Lead Exposure Control TA.</p> <ul style="list-style-type: none"> <li>• If launderable coveralls are to be used in an area identified in step 1, a laundry handling plan must be written and approved by the Occupational Lead Exposure Control TA.</li> <li>• The plan must be compliant with the requirements of 29 CFR 1926.62(g).</li> </ul>

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## 3.4.4 Respiratory Protection

Respiratory protection program requirements are documented PRC-PRO-SH-120, *Respiratory Protection Program*.

Table 1 - Interim Respiratory Protection Requirements

Task That Disturbs Lead Containing Coating or Paint	Minimum Required Respiratory Protection
<ul style="list-style-type: none"> <li>Manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems</li> <li>Spray painting with lead paint</li> <li>Any tasks where the employer has any reason to believe exposure could be in excess of the PEL.</li> </ul>	Half face APR with P100 cartridges
<ul style="list-style-type: none"> <li>Rivet busting; power tool cleaning without dust collection systems; cleanup activities where dry expendable abrasives are used; and abrasive blasting enclosure movement and removal</li> <li>Using lead-containing mortar</li> <li>Lead burning</li> </ul>	Full face APR with P100 cartridges
<ul style="list-style-type: none"> <li>Abrasive blasting,</li> <li>Welding,</li> <li>Cutting, and</li> <li>Torch burning</li> </ul>	Full face PAPR or hood PAPR* with P100 cartridges  * - Hood PAPR's must be certified by their manufacturer as providing a Assigned Protection Factor of 1000

Actionee	Step	Action
OS&IH Professional	1.	IDENTIFY all respiratory protection requirements in the compliance plan.

## 3.4.5 Housekeeping

Actionee	Step	Action
OS&IH Professional	1.	IDENTIFY any specific housekeeping requirements in the compliance plan that are necessary to ensure that all surfaces are maintained as free as practicable of accumulations of lead.

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### 3.4.6 Hygiene Facilities and Practices

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
OS&IH Professional	1.	<p>IDENTIFY the hygiene facility requirements in the compliance plan. The minimum hygiene facilities include:</p> <ul style="list-style-type: none"> <li>• Change areas</li> <li>• Eating facilities</li> <li>• Handwashing facilities</li> </ul>
	2.	<p>DETERMINE whether shower facilities are required.</p> <ul style="list-style-type: none"> <li>• General Industry (as determined in Section 3.2) – Shower facilities are required for all employees whose exposure may exceed the PEL</li> <li>• Construction (as determined in Section 3.2) – Shower facilities are required whenever feasible for employees whose exposure may exceed the PEL</li> </ul>
	3.	DOCUMENT the shower facility requirements in the compliance plan.
	4.	<p>IDENTIFY required hygiene practices in the compliance plan. Hygiene practice that may be required include:</p> <ul style="list-style-type: none"> <li>• No eating, drinking, smoking, or applying cosmetics in the work area</li> <li>• Mandatory hand and face washing prior to eating, drinking, smoking, or applying cosmetics</li> <li>• Removal of protective work clothing when leaving the work area</li> <li>• HEPA vacuuming of protective work clothing prior to entering lunchroom facilities, kitchens, or eating areas</li> <li>• Mandatory showering at the end of the employee's shift</li> </ul>

### 3.5 Employee Training

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Line Management	1.	IDENTIFY all employees that have the potential for airborne exposure to lead at any concentration.

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Actionee	Step	Action
Line Management	2.	<p>SCHEDULE all employees that have the potential for airborne exposure to lead for training based on the potential highest exposure:</p> <ul style="list-style-type: none"> <li>• Employees with the potential for exposure above the action level shall receive <i>Training Course 020150 (Lead Worker Training)</i>.</li> <li>• Employees that have the potential for airborne exposure to lead at any concentration have been briefed on the contents of Appendices A and B of 10 CFR 1910.1025.</li> </ul>

**NOTE:** *The preferred method for providing the information in Appendices A and B is through Training Course 600034 (Lead Awareness Training). Training Course 020150 (Lead Worker Training) also fulfills the requirement for this training. For emergent situations where employees may have exposure to airborne lead, an OS&IH professional may brief workers on Appendices A and B so that they may work. Employees briefed by an OS&IH professional are expected to complete either course 600034 or course 020150 in a timely manner.*

3. ENSURE that all employees that have received the appropriate training prior to commencing work.

### 3.6 Signs

Actionee	Step	Action
Line Management	1.	<p>ENSURE that all areas where employee exposures to lead may exceed the PEL are posted with signs stating the following:</p> <ol style="list-style-type: none"> <li>a. WARNING</li> <li>b. LEAD WORK AREA</li> <li>c. POISON</li> <li>d. NO SMOKING OR EATING</li> </ol>

### 3.7 Oversight of Lead Work

Actionee	Step	Action
Line Management	1.	ENSURE that the mechanical performance of the system in controlling exposure is evaluated as necessary to maintain its effectiveness.
	2.	ENSURE that employees follow good work practices as defined in Lead Awareness and Lead Worker training.
	3.	ENSURE that all required protective work clothing and equipment is available to employees and is maintained in good condition.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Line Management	4.	ENSURE that employees remove protective clothing in the change area.
	5.	ENSURE that all contaminated protective clothing is disposed of in a closed container that has the following label:  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.
<b>NOTE:</b>		<i>The requirement for the labeling of contaminated clothing only applies when the clothing is worn in areas where employee exposure exceeds the PEL.</i>
	6.	ENSURE that the removal of lead from protective clothing and equipment is done using methods that minimizes the dispersion of dust into the air. Blowing, shaking, or any other means which disperses lead into the air are prohibited.
	7.	ENSURE that all surfaces are maintained as free as practicable of accumulations of lead.
	8.	ENSURE that the cleaning of floors and other surfaces are done in accordance with the compliance plan.
	9.	ENSURE that all required hygiene facilities are available prior to commencing work.
	10.	ENSURE that employees comply with all required hygiene practices.
OS&IH Professional	11.	ENSURE that all required exposure monitoring (and any other required OS&IH activities) are conducted as required by the compliance plan.
	12.	CONDUCT oversight of the work as required by the compliance plan.

**4.0 FORMS**

CHPRC Lead Compliance Plan Template, Site Form A-6004-746

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**5.0 RECORD IDENTIFICATION**

All records are required to be managed in accordance with PRC-PRO-IRM-10588, *Records Management Processes*.

**Records Capture Table**

<b>Name of Record</b>	<b>Submittal Responsibility</b>	<b>Retention Responsibility</b>
Objective data demonstrating that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing	Line Management in accordance with PRC-PRO-SH-409	In accordance with PRC-PRO-SH-409
Lead exposure monitoring data	Line Management in accordance with PRC-PRO-SH-409	Site Wide Industrial Hygiene Database (SWIHD)
<i>CHPRC Lead Compliance Plan Template, A-6004-746</i>	Line Management in accordance with PRC-PRO-SH-409	Line Management in accordance with PRC-PRO-SH-409

**6.0 SOURCES****6.1 Requirements**

10 CFR 851, *Worker Safety and Health Program*  
 29 CFR 1910.1025, *Lead*  
 29 CFR 1910.62, *Lead*  
 29 CFR 1910.1020, *Access to Employee Exposure and Medical Records*  
 PRC-MP-SH-32219, *CHPRC Worker Safety and Health Program Description*

**6.2 References**

ACGIH, *2011 TLVs® and BEIs®*  
 PRC-PRO-IRM-10588, *Records Management Processes*  
 PRC-PRO-SH-120, *Respiratory Protection Program*  
 PRC-PRO-SH-409, *Industrial Hygiene Monitoring, Reporting, and Records Management*  
 PRC-RD-SH-11058, *Occupational Medical Qualification and Monitoring*

**7.0 APPENDIXES**

Appendix A - Typical Lead Containing Materials and Activities  
 Appendix B - Objective Basis for Establishing a De minimus Condition for Lead  
 Appendix C - Occupational Lead Exposure Control Requirements Summary



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### Appendix A - Typical Lead Containing Materials and Activities

Lead may be found in paints, shielding materials, bulk metals, solders, alloys, nails for metal roofs, mortars, glass, piping systems, ammunition, metal seams and joints, laboratory and process chemicals, various equipment and building components, waste materials, and contaminated environmental media, as well as in other materials.

Lead exposure may result from a variety of operations/activities, including but not limited to the following:

- Lead-brick shielding/handling,
- Weapons firing (patrol),
- Pouring molten lead,
- Soldering,
- Welding/cutting/grinding,
- Sandblasting, abrasive blasting,
- Painting and paint removal,
- Loading lead ballast/shot,
- Use of powder actuated tools,
- Lead cable pulling, and
- Maintenance activities involving lead or lead containing materials.

#### **Operations covered under OSHA's *Lead* construction standard (29 CFR 1926.62)**

The OSHA *Lead* construction standard defines covered construction work as construction, alteration and repair, including painting and decorating. It includes, but is not limited to the following:

- Demolition or salvage of structures where lead or materials containing lead are present;
- Removal or encapsulation of materials containing lead (e.g. lead paint abatement);
- New construction, alteration, repair, or renovation of structures, substrates or portions thereof, that contain lead or lead-containing materials;
- Installation of products containing lead;
- Lead contamination/emergency cleanup;
- Transportation, disposal, storage, or containment of lead or lead-containing materials on the site or location at which construction activities are performed; and
- Maintenance operations associated with the construction activities described in this paragraph.

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### Appendix B - Objective Basis for Establishing a De minimus Condition for Lead

The construction standard does not specify a de minimus level of lead in materials below which the requirements of the lead standard do not apply. It is noted in the preamble to the lead construction standard (58 FR 26590, *Interim Final Standard, Lead in Construction*, May 4, 1993), that the construction standard applies to all occupational exposure to lead in all construction work in which lead, in any amount, is present in an occupationally related context. Exposure of employees to the ambient environment that may contain small concentrations of lead unrelated to the job is **not** subject to the standard (i.e., soils containing normal ambient concentrations of lead). Where the source of lead is employment related, all exposure to lead is covered by the standard.

The preamble goes on to state that although the standard may apply to a particular activity that involves materials containing small lead concentrations, certain minimum levels of lead exposure trigger almost all of the obligations in the standard. For example, periodic exposure monitoring and medical surveillance are required only if employee exposure is in excess of the AL. This distinction is made to differentiate between hazardous and relatively non-hazardous work operations and to impose obligations commensurate to the degree of hazard present. It is, therefore, not the intent of the standard to require compliance with all provisions where exposure to lead is at levels insignificant to workers' health.

The preamble also explains the logic for not establishing a de minimus level of lead in materials. The rationale points out the difficulty in relying on material concentrations to predict airborne concentrations, because of the variability based on activity and material type. Therefore, OSHA opted to trigger obligations of the standard based on personal exposures (i.e., the action level and permissible exposure limit).

A de minimus level of lead, therefore, cannot be defined in this procedure that would be applicable to all materials and all activities. However, a defensible rationale can be developed for a de minimus condition that combines a lead-in-material concentration threshold with a co-located indicator parameter (total particulates).

For the purposes of this procedure, dust- or mist-generating activities are generally safe from occupational exposure to lead above the AL:

- When the total lead content of materials involved is less than 1,000 µg/g (ppm) (0.1%), and
- When total particulates in the breathing zone of workers are maintained below the Threshold Limit Value (TLV) of 10 mg/m<sup>3</sup> as an 8-hour TWA. Both of these criteria must be met. This de minimus condition does not apply to lead fume-generating activities (i.e. heat producing activities such as welding and burning).

The objective basis for this de minimus condition is as follows. For a material with a total lead concentration of 1,000 µg/g, total airborne particulate concentrations of 30 mg/m<sup>3</sup> would have to be generated in the breathing zone of a worker over an 8-hour work shift to result in a lead exposure at the AL. This total particulate concentration is three times greater than the TLV of 10 mg/m<sup>3</sup> for total particulates. To apply this 1,000 µg/g (0.1%) criterion, line management must ensure that total particulate concentrations in the breathing zone of workers, regardless of

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respiratory protection, are controlled to below the total particulate TLV of 10 mg/m<sup>3</sup>, which offers a threefold margin of safety for lead exposure relative to the AL. This de minimus condition does not apply to fume generating activities, because heat can selectively liberate lead fume from the material into the air and the worker's breathing zone.

This de minimus condition is based on fundamental industrial hygiene principles and not based on regulation. As such, its application must be done with project OS&IH professional input and must be based on a hazard analysis of jobs and tasks. Other accepted risk assessment or industrial hygiene analyses may also be acceptable for defining de minimus conditions. Whenever applying the de minimus condition to construction activities, it must be done with appropriate input from the project OS&IH professional who should evaluate whether there is reason to believe exposures could be at or above the action level.

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**Appendix C - Occupational Lead Exposure Control Requirements Summary**

Requirement	Any lead activity		Airborne lead present		Exposure above AL		Exposure above PEL	
	1910	1926	1910	1926	1910	1926	1910	1926
Determination of Appropriate OSHA Regulation (3.2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hazard Identification and Documentation (3.3)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compliance Plan (3.4)	No	Yes	No	Yes	No	Yes	Yes	Yes
Employee Training (3.5)	Course 600034	Course 600034	Course 600034	Course 600034	Course 020150	Course 020150	Course 020150	Course 020150
Signs (3.6)	No	No	No	No	No	No	Yes	Yes