Section 2.03 Lead Exposure Control Program

1. Scope

The Lead Exposure Control Program (LECP) applies to all Bureau of Reclamation (Reclamation) owned facilities to provide protection from occupational exposure to lead for Reclamation employees performing construction and maintenance work activities covered in Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62, Lead, and 29 CFR 1910.1025, Lead.

2. General Requirements

a. Permissible Exposure and Action Level

Reclamation’s goal is to limit employee exposure to lead during construction work activities. Employees must not experience exposure to an airborne lead concentration greater than the permissible exposure limit (PEL) of 50 microgram/cubic meter ($\mu$g/m$^3$) as an eight-hour time weighted average (TWA). The competent person (CP) will implement additional measures when employee exposures meet or exceed the action level (AL) of 30 $\mu$g/m$^3$ as an eight-hour TWA. If an employee is exposed to lead for more than eight hours in a workday, the PEL shall be reduced according to the following formula:

- Allowable employee exposure in $\mu$g/m$^3$ = 400 divided by hours worked in the day. For example, employees working a shift of 10 hours a day, the exposure would be $400/10 = 40 \mu$g/ m$^3$.

b. Respirator Use

Employees must use respirators to limit exposure to airborne lead and a written respiratory protection program must be in place as outlined in Reclamation Safety and Health Standards (RSHS) Section 2.08, Respiratory Protection Program. First-line supervisors must implement engineering and work practice controls for employee exposure at the level provided by the respirator’s protection factor when the respirator is worn. The periods of exposure may be averaged with exposure levels when respirators are not worn to determine the employee's daily TWA exposure.

c. Lead Waste Disposal

Lead waste disposal requirements shall follow Federal and local environmental regulations where the site/facility is located.
3. Responsibilities

a. Regional Safety Managers
   • Shall assist in developing, establishing, and coordinating periodic reviews of regional LECPs.

b. Regional Industrial Hygienists (IH)
   • Shall provide technical assistance to the CP such as exposure monitoring, respirator selection, fit testing, and training.

c. Area Office Managers
   • Shall select an area office CP who can identify and correct lead hazards.
   • Shall provide the necessary resources to implement and maintain procedures within the LECP.

d. Competent Persons
   • Shall complete the training outlined in paragraph 2.03.4, Training Requirements.
   • Shall perform frequent inspections of job sites(s), materials, and equipment where lead work is performed.
   • Shall confirm engineering and work practice controls are outlined in the lead work plan.
   • Shall successfully complete a hands-on training course given by their IH or a course that covers sampling methods, exposure limits, and dust/gas/vapor sampling if they will be conducting exposure monitoring as outlined in paragraph 2.03.8.a, Exposure Assessment.
   • Shall consult with the region’s IH on tasks involving lead work and any required exposure monitoring outlined in paragraph 2.03.8.a.
   • Shall coordinate or conduct annual refresher training per paragraph 2.03.4.
   • Shall coordinate with the first-line supervisor to provide affected employees and designated representatives with the proper personal protective equipment (PPE) to observe monitoring as outlined in paragraph 2.03.8.a.(1), Observation of Monitoring.

e. First-Line Supervisors
   • Shall ensure employees performing lead work, or have potential exposure to lead, are trained per paragraph 2.03.4.
   • Shall attend training at the same level as their employees performing lead work.
   • Shall coordinate required medical examinations for employees performing lead work activities as outlined in paragraphs 2.03.8.d, Medical Surveillance and 2.03.8.e, Biological Monitoring.
   • Shall verify employees are medically cleared, trained, and fit tested on the type of respiratory protection used when performing lead work.
• Shall notify the CP of all work with potential for lead exposure which may exceed the PEL or AL at least two weeks prior to lead work activities.
• Shall ensure engineering controls are working properly for lead work activities.
• Shall ensure that employees have the proper work clothing and required PPE for job tasks with the potential for lead exposure.

f. Employees with Potential for Lead Exposure
• Shall attend the training outlined in paragraph 2.03.4, annually and follow the requirements outlined in the LECP.
• Shall review the Job Hazard Analysis (JHA) and lead work plan prior to conducting job tasks with the potential for lead exposure and follow the identified precautions and PPE requirements.
• Shall not eat or drink in areas with the potential for lead exposure.
• Shall follow proper disposal procedures for contaminated protective clothing at the completion of the work shift.
• Shall complete any medical and periodic examinations as required by paragraph 2.03.8.d.
• Shall follow the elements in RSHS Section 2.08 if the employee is using a respirator.

g. Human Resources
• Shall maintain medical clearance documentation and provide the CP with clearance results of employees participating in the LECP.

4. Training Requirements

a. Employees with Potential for Lead Exposure
Employees working where there is a potential exposure to airborne lead, at or above the AL, shall receive training covering the following topics:

• content of 29 CFR 1926.62, Lead, and this section,
• specific job tasks which may result in exposures above the AL,
• results of initial lead monitoring and similar exposed groups,
• proper selection, fitting, use, and limitations of respiratory protection,
• description of the medical surveillance program,
• the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead,
• ways in which lead enters the body,
• reporting signs and symptoms of health problems,
• central nervous system, kidney, and blood effects,
• acute and chronic effects of overexposure to lead,
the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant,
- why employees should not routinely use chelating agents to remove lead from employees’ bodies and why they will only be used under the direction of a licensed physician,
- protective work clothing, equipment, hygiene practices, and housekeeping,
- engineering controls and safe work practices associated with the employee’s job assignment,
- site/facility’s LECP, and
- employee’s right of access to records under 29 CFR 1910.1020, Access to Employee Exposure and Medical Records.

b. Refresher
Training outlined in paragraph 2.03.4.a, Employees with Potential for Lead Exposure, shall be conducted or coordinated by the CP annually.

c. Proficiency Qualification
Retraining is necessary when the CP or an employee demonstrates a lack of knowledge of lead work practices, the program elements of this section, or if there are changes to the program which could affect work practices or procedures.

d. Recordkeeping
The Department of the Interior shall keep all Reclamation training records in the official repository.

5. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment
The CP shall coordinate an initial employee exposure assessment, outlined in paragraph 2.03.8.a, for lead work activities determining if any employee(s) may be exposed to lead at or above the AL (e.g., exposure which would occur if the employee was not wearing respiratory protection).

b. Safety Measures
- Hygiene. Tobacco, cosmetic products, food, and beverages are forbidden in areas where employees are exposed to lead at or above the PEL (without regard to respirator use).
- Change Areas. The site/facility shall provide a change area to employees exposed to lead at or above the PEL. The site/facility shall equip the change area with separate storage facilities for protective work clothing, equipment, and street clothes to prevent cross-contamination.
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Applicability: Reclamation Employees, Facilities, Operations, and Contractors

- Showers. The site/facility shall provide showers, towels, and cleansing agents to employees who are exposed at or above the PEL.
- Eating Facilities/Areas. The site/facility shall provide employees exposed at or above the PEL with eating facilities/areas readily accessible and as free as from lead contamination as practicable. Employees shall not wear protective clothing inside eating facilities/areas.
- Hand Washing Facilities. The site/facility shall provide hand washing facilities for employees who are potentially exposed to lead.
- Precautions to Reduce or Eliminate Lead Exposures. Reclamation employees shall take additional precautions to eliminate lead exposures:
  - wear the required PPE,
  - always wash hands and face before eating, drinking, applying cosmetics, using tobacco products, or using the restroom,
  - avoid hand-to-face contact and nail biting in work areas where lead is present,
  - maintain work surfaces free from accumulations of lead-containing materials as practicable,
  - never sweep or use compressed air to clean up spills, clothing, or surfaces where lead dust may be present (i.e., wiping/mopping are acceptable cleaning methods),
  - use a vacuum equipped with a High Efficiency Particulate Air (HEPA) filter to clean work surfaces which may contain lead materials,
  - remove contaminated clothing and place in the properly labeled container, and
  - attend lead safety training annually, reviewing hazards and precautions necessary for minimizing lead exposures.

6. Pre-job Briefing and Planning Requirements

JHA. All lead work activities shall have a written JHA that includes a lead work plan reflecting the protective safety and health expectations and control measures associated with the applicable operations prior to initiating lead work activities. The CP, in coordination with the first-line supervisor, shall review JHAs involving lead tasks and consult with their IH to perform any required exposure assessments.

7. Personal Protective Equipment (PPE)

a. Respiratory Protection

Employees shall use respirators and adhere to the requirements in RSHS Section 2.08 An employee shall use a respirator when:

- exposure to lead exceeds the AL,
- engineering and work practice controls are not adequate to reduce exposures below the AL, and
• when interim protection measures are in place during an exposure assessment.

b. Protective Clothing
First-line supervisor shall provide work clothing that prevents contamination of personal clothing to employees performing lead work activities exposed at or above the AL, without regard to respirator use. Examples include coveralls, full-body clothing, gloves, face shields, goggles, or any other items deemed necessary for the job tasks. All protective clothing shall be repaired or replaced to maintain effectiveness.

- Laundering of Contaminated Clothing. The site/facility shall provide cleaning/laundering/disposal for protective clothing. The site/facility will launder contaminated protective clothing weekly, or daily if lead levels are above 200 μg/m³ as an eight-hour TWA, without regard to respiratory use. The site/facility shall inform the cleaning/laundering service that the protective clothing contains lead and inform them in writing of the potential harmful effects from lead exposure.

- Containers for Contaminated Clothing. Employees shall not shake or blow off contaminated clothing or perform any other method which may disperse lead dust into the air prior to placing the contaminated clothing in the container for cleaning, laundering, or disposal. The following label shall be adhered to all containers of lead contaminated clothing:

FIGURE 2.03-1 Containers for Contaminated Clothing Label

DANGER
CLOTHING AND EQUIPMENT CONTAMINATED WITH LEAD. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM. DO NOT EAT, DRINK, OR SMOKE WHEN HANDLING. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE FEDERAL AND LOCAL REGULATIONS.

8. Safe Practices

a. Exposure Assessment
The CP shall conduct or coordinate personal exposure monitoring with the IH for employees performing work activities with the potential for lead exposure. Air monitoring shall accurately represent the employee’s regular daily exposure to determine if it is at or above the AL. Representative, full-shift sampling shall include one sample for each job classification/shift or during the shift with the highest potential for exposure.

- Observation of Monitoring. Affected employees, or designated representatives, shall have the opportunity to observe any monitoring conducted on employees for potential lead exposure. The CP, in coordination with the first-line supervisor, shall provide the
required equipment to observers entering an area where respirators and protective clothing or equipment are required. Observers must meet the regulatory requirements for use of required equipment and not interfere with the monitoring. An explanation of the monitoring procedures and measurements, and the CP will provide a copy of the laboratory results to the affected employee(s) and representative(s).

- **Job Tasks Considered Above the PEL.** If the CP or IH has not performed an employee exposure assessment for the following lead-related tasks, then employee shall be considered exposed above, but not more than 10 times, the PEL and protective measures shall be implemented:
  
  - manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems, where lead-containing coatings or paint are present, and
  - spray painting with lead paint.

- **Job Task Considered Exposure Above 500 μg/m³.** If the CP or IH has not performed an employee exposure assessment for the following lead related tasks, the employee is considered exposed above 500 μg/m³ and protective measures shall be implemented:
  
  - using lead-containing mortar,
  - lead burning,
  - work activities where lead-containing coatings or paint are present,
  - rivet busting,
  - power tool cleaning without dust collection systems,
  - cleanup activities using dry expendable abrasives, and
  - abrasive blasting enclosure movement and removal.

If previous results indicate the employee is exposed to levels of lead below 500 μg/m³, the first-line supervisor may provide the employee with the appropriate respirator for use at lower exposures.

- **Job Tasks Considered Exposure Above 2500 μg/m³.** If the CP or IH has not performed an employee exposure assessment for the following lead related tasks, the employee is considered exposed above 2500 μg/m³ and employee protective measures shall be implemented:
  
  - abrasive blasting,
  - welding,
  - cutting, and
  - torch burning.
If previous results indicate the employee is exposed to levels of lead below 2500 μg/m³, the first-line supervisor may provide the employee with the appropriate respirator for use at lower exposures.

- **Basis of Initial Determination**
  
  - Initial Determination. Employee exposure monitoring shall be based on employee monitoring results and the following:
    
    - observations or calculations which indicate employee exposure to lead,
    - any previous measurements of airborne lead, and/or
    - any employee complaints of symptoms attributed to lead exposure.

  - Monitoring Results Satisfying Initial Determination. When monitoring for lead exposure has been done within the past 12 months and was conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions, then those monitoring results may be used.

  - Subsequent Monitoring. If the initial determination, or subsequent monitoring, reveals an employee exposure at or above the AL, but below the PEL, the CP or the IH must repeat monitoring at least every six months. Monitoring shall continue until at least two consecutive measurements, taken at least seven days apart, are below the AL at which time the site/facility may discontinue monitoring.

  - Objective Data. When objective data demonstrates a product or material containing lead, or a specific process, operation, or activity involving lead cannot result in employee exposure at or above the AL during processing, use, or handling, then the data is acceptable in place of initial monitoring.

  - Objective Data Documentation. The CP or the IH shall document objective data. Reclamation must maintain objective data for at least 30 years, and be available to affected employees, former employees, and designated representatives.

- **Negative Determination.** The CP or the IH shall provide written documentation when initially monitoring and determining the employee is not exposed to airborne concentrations of lead at or above the AL. The record shall include the information in paragraph 2.03.8.a.6.a, Initial Determination, the date of determination, location within the worksite, and the name of each employee monitored. No further exposure monitoring is required unless:

  - there has been a change of equipment, process, controls, employees, or
  - a new task may result in additional employee exposure at or above the AL, or
  - a new task may result in employees who are already exposed at or above the AL potentially being exposed over the PEL.
Employee Notification of Monitoring Results. The first-line supervisor in coordination with the CP and/or IH shall notify affected employees, in writing, of monitoring results within five business days.

Employee Monitoring Results at or Above the PEL. When employee monitoring results are at or above the PEL, without regard to respiratory protection, the written notification shall include control measures and corrective actions to reduce the exposure below the PEL.

Methods of Compliance. The CP and/or first-line supervisor shall ensure that engineering, work practice controls, and administrative controls are used to reduce and maintain employee exposure to lead at or below the PEL. If the controls do not reduce exposure levels below the PEL, they shall be used to reduce employee exposure to the lowest feasible level and supplemented with respiratory protection.

- Mechanical Ventilation. The site/facility shall perform duct and capture velocity and static pressure measurements at least every three months when used to control lead exposures and within five days of any changes to job task(s) which may alter the employee’s exposure to lead.
- Recirculated Exhaust Ventilation. The site/facility shall use a high-efficiency filter with a back-up filter when air is recirculated from a lead job task. The system shall have controls to monitor the concentration of lead in the return air and means to bypass the recirculation system automatically if it fails.
- Administrative Controls. The first-line supervisor shall implement a job rotation schedule to reduce an employee’s lead exposure which includes:
  - employee’s name or identification,
  - duration and employee’s exposure levels for each job task, and
  - any other information validating the administrative control.

b. Lead Work Plan
First-line supervisor, in coordination with the CP and/or the IH shall develop and implement a work plan for each job task with the potential for lead exposure at or above the PEL. The work plan shall be part of the JHA and address the following elements:

- detailed description of each work activity with the potential for lead exposure including equipment used, employee job responsibilities, and operating and maintenance practices,
- description of the specific means used to achieve compliance, where engineering controls are required, and engineering plans and studies used to determine methods selected for controlling exposure to lead,
- report of the technology considered in meeting the PEL,
- air monitoring data which identifies the potential source of lead exposure,
- engineering controls including the selection method to reduce exposures below the PEL,
• work practice and administrative controls including a job rotation schedule identifying the affected employee and the time and exposure level at each task,
• decontamination procedures for protective clothing,
• hygiene facilities, practices, and change areas,
• required PPE,
• work area clean-up procedures including HEPA vacuuming and wet wiping, and
• procedure for the final inspection of lead dust/debris by the CP.

c. Exposure Monitoring Records
Reclamation shall keep all monitoring and other data used in conducting employee exposure assessments in accordance with 29 CFR 1910.1020 and contain the following information:

• date(s), number, duration, location, and results of each of the samples taken including a description of the sampling procedure used to determine representative employee exposure,
• description of the sampling and analytical methods used and evidence of accuracy,
• type of respiratory protective devices worn,
• name and job classification of the employee monitored and names of all other measurement-representing employees, and
• any environmental variables affecting the measurement of employee exposure.

d. Medical Surveillance
• Employees Exposed at or Above the AL for Any One Day. The first-line supervisor in coordination with the CP and/or IH will make initial medical surveillance available to employees occupationally exposed on any one day to lead at or above the AL.
• Employees Exposure at or Above the AL for 30 Days. The first-line supervisor in coordination with the CP and/or IH will implement a medical surveillance program consisting of blood lead and zinc protoporphyrin (ZPP) for employees who are or may be occupationally exposed at or above the AL for more than 30 days in any consecutive 12 months.

e. Biological Monitoring
• Blood Lead and ZPP Level Sampling and Analysis. Employees covered in paragraph 2.03.8.d shall have a physician or other licensed health care professional (PLHCP) conduct biological monitoring in the form of blood sampling and analysis for lead and ZPP. This shall occur every two months for the first six months and then every six months afterwards.
• Blood Lead Level (BLL) at or Above 40 μg/dl. The first-line supervisor will notify and place employees in temporary medical removal, with medical removal protection benefits, when a periodic and/or a follow-up blood sampling test indicates the employee’s BLL is at or above 50 µg/dl. The employee will complete a follow-up test
within two weeks of the first blood test which indicated the employee's BLL was at or above 50 µg/dl.

- Medical Examinations and Consultations. The PLHCP will conduct medical examinations and consultations with the following frequency:
  - annually for each employee identified in paragraph 2.03.8.d., Employees Exposure at or Above the AL for 30 Days, with a blood lead test indicating a BLL at or above 40 µg/dl during the preceding 12 months,
  - as soon as possible when an employee develops signs or symptoms associated with lead intoxication,
  - when the employee is pregnant, wants medical advice on the effects of past or current exposures to lead, or wants information on the ability to procreate a healthy child after past or current exposure to lead,
  - has demonstrated difficulty in breathing during a respirator fit test or during respirator use, and/or
  - as medically appropriate for each employee either removed from exposure to lead due to a risk of impairment to health, or otherwise limited pursuant to a final medical determination.

- Medical Examination Elements. Annual medical examinations required in paragraph 2.03.8.e., Medical Examinations and Consultations, shall include the following elements:
  - detailed work and medical history, with attention to past lead exposure (i.e., occupational and non-occupational), personal habits (e.g., smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive, and neurological problems,
  - thorough physical examination, with attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems (a PLHCP must evaluate the employee's pulmonary system if respiratory protection will be used),
  - blood pressure measurement,
  - blood sample determining BLL, hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology, ZPP, blood urea, and nitrogen serum creatinine, and
  - urinalysis with microscopic examination and any other testing the physician deems necessary.

- Medical Examination and Procedures. A PLHCP shall conduct all medical examinations and procedures at no cost to the employee, including multiple
physician reviews. The CP or first-line supervisor shall provide the employee their results, in writing, within five business days.

- Information for the Physician. The CP or first-line supervisor shall provide the following information to the physician performing the medical examination:
  - copy of 29 CFR 1926.62 and 29 CFR 1910.1025,
  - description of the affected employee’s duties,
  - the employee’s determined or anticipated exposure level to lead or other toxic substances,
  - description of required PPE,
  - prior blood lead determinations, and
  - prior medical opinions.

- Information Provided to the Employee. The employee shall receive a written copy of the medical opinion from each physician which contains only the following information:
  - physician’s opinion if a medical condition would place the employee at increased risk of material impairment from exposure to lead,
  - recommended special protective measures or limitations for the employee,
  - recommended limitation of employee’s respirator use, including whether the employee can wear a powered air-purifying respirator if a physician determines the employee cannot wear a negative pressure respirator, and
  - results of the BLL determinations.

- Multiple Physician Review. Employees may designate a second physician to review the results, findings, determinations, or recommendations, and to conduct additional lab tests deemed necessary. The employee must make an appointment requesting a second medical opinion within 15 days after receiving the notification or the initial physician’s written opinion, whichever is later.
  - Differing Medical Opinions. If two physicians’ opinions differ, the site/facility and employee must resolve the disagreement. If not resolved, the site/facility and employee must designate a third physician to review the findings, conduct an examination, consultation, and lab tests or discuss with the previous physicians to resolve the disagreement.
  - Resolution of Differing Medical Opinions. The site/facility shall use the findings, determinations, and recommendations of the third physician, unless an agreement is made with the employee which is consistent with the recommendations of at least one of the three physicians.
f. Medical Removal Protection

- Temporary Medical Removal Due to Elevated BLL. The first-line supervisor shall remove any employee exposed to lead at or above the AL or has a periodic/follow-up blood test indicate a BLL at or above 50 µg/dl from work.
- Temporary Removal Due to Final Medical Determination. The first-line supervisor shall remove any employee with a detected medical condition or an increased risk of health impairment from lead exposure at or above the AL. The first-line supervisor shall implement any recommended special protective measures or limitations to exposure.
  - Return to Work. Employees may return to work when two consecutive blood tests indicate the BLL is below 40 µg/dl.
  - Return to Work Due to Final Medical Determination. Employees may return to work when a subsequent final medical determination indicates limitations or special protective measures are no longer required.
  - Return to Work Exceptions. The employee may return to work, end any special protective measures, and remove any limitations excluding the following exceptions:
    - if the initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician, and/or
    - if the employee has been on removal status for the preceding 18 months due to an elevated BLL.
  - Medical Removal Protection Benefits. The site/facility shall provide employees up to 18 months of medical removal protection benefits for each removal from lead exposure.
  - Follow-up Medical Surveillance. During employee removal, or required limitations, the site/facility may require the employee to participate in follow-up medical surveillance to receive medical removal protection benefits.
  - Medical Removal Surveillance Documentation. For each employee removed, the site/facility shall maintain a record for the duration of employment including:
    - name, dates each time the employee was removed, and date the employee returned to work, and
    - information on how the removal was accomplished and if it was the result of an elevated BLL.

9. Communication Requirements

a. Hazard Communication
The site/facility shall cover lead in the hazard communication program to include container labeling, safety data sheets, and training outlined in RSHS Section 1.19.
b. Signs
The site/facility shall post readily visible signs in each area where exposure is above the PEL:

**FIGURE 2.03-2: Exposure Above PEL Signage**

<table>
<thead>
<tr>
<th>DANGER LEAD WORK AREA</th>
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<tbody>
<tr>
<td>MAY DAMAGE FERTILITY OR THE UNBORN CHILD CAUSES DAMAGE TO THE</td>
</tr>
<tr>
<td>CENTRAL NERVOUS SYSTEM DO NOT EAT, DRINK, OR SMOKE IN THIS AREA</td>
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</tbody>
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▲ RSHS Appendix A: Definitions

RSHS Appendix A ([Definitions](https://www.usbr.gov/safety/rshs/index.html)) is available to print at:


▲ RSHS Appendix B: Additional References and Citations

RSHS Appendix B ([Additional References and Citations](https://www.usbr.gov/safety/rshs/index.html)) is available to print at: