# PLANT OPERATIONS
## LEAD COMPLIANCE PROGRAM

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University of Michigan Plant Operations
Lead Compliance Program

I. PURPOSE AND SCOPE

A. Primary Purpose: to maintain employee exposure to lead aerosols at levels that are below the Permissible Exposure Limit and the Action Level as defined by the MIOSHA “Lead” rules 325.51901-325.51958 and "Lead in Construction" rules 325.51991-325.51992.

B. Secondary Purpose: to maintain compliance with the MIDCH “Lead Hazard Remediation” rules 325.9901-325.9925 and USEPA regulations 40 CFR Part 745, as they pertain to target housing and child-occupied facilities.

C. Scope: all work operations where lead-containing materials (LCM) are disturbed in a manner that is likely to result in occupational exposure to lead aerosols.

II. DEFINITIONS

A. **Action Level (AL)** - is established by the federal and state regulations to be 30 micrograms of lead per cubic meter of air (µg/m³).

B. **Child-occupied Facility** – any portion of a building built before 1978, visited regularly by the same child, who is six years old or younger, at least two different days a week for at least three hours per visit, for a combined weekly visit time of at least six hours, and a combined annual visit time of at least 60 hours.

C. **Lead** – means metallic lead, all inorganic lead compounds and organic lead soaps. Does not include any other organic form of lead.

D. **Lead Containing Material (LCM)** - a material containing 0.5% or more lead by weight.

E. **Lead-based Paint** - as defined by the U.S. Environmental Protection Agency, lead-based paint is paint or other surface coatings that contain lead equal to or in excess of 0.5 percent by weight or 1.0 milligram per square centimeter.

F. **Permissible Exposure Limit (PEL)** - is established by the federal and state regulations to be 50 micrograms of lead per cubic meter of air (µg/m³).

G. **Target Housing** – any housing constructed before 1978, except zero bedroom dwellings or housing for the elderly, or the disabled, unless this includes a child six years old or under.

H. **Work Area** - refers to the area within a critical barrier and is the immediate work area of the employees covered under the scope of this program.
III. RESPONSIBILITIES

A. Department

1. Management - Supervisors will:
   a. instruct their employees regarding the requirements of this program.
   b. effectively enforce compliance of this program’s procedures, including the use of disciplinary action, for any violations or deviations from the procedures outlined in this program.
   c. assure that the equipment required for compliance with this program is in proper working order, inspected and tested as required, and made available for use to their employees.
   d. promptly investigate and report all lead related health problems.

2. Employees will:
   a. comply with the procedures of this program.
   b. consult with their supervisor, OSEH, or other knowledgeable personnel, when they have questions regarding their workplace safety and health.
   c. report any accidents or job related injuries or illnesses to their supervisor and seek prompt medical treatment, if necessary.

B. Occupational Safety and Environmental Health (OSEH)

1. OSEH shall provide technical assistance on compliance with this program and the OSHA/MIOSHA standards, when called upon.

2. OSEH shall provide training, and training guidance and assistance, as required.

3. OSEH shall inspect work sites pursuant to this program, to insure the safety and health of University employees’.

IV. PROCEDURE

A. General

1. Exposure of workers, occupants or the environment to lead or lead containing materials (LCM) will be kept as low as practical without creating additional or more severe hazards.

2. As a general process, the control of LCM will follow this sequence:
   a. Determine if the building was built before 1978 and the project includes any target housing or child-occupied facilities. If yes, then this project site must be inspected by a state certified lead
inspector and any lead abatement work must be done by state certified lead workers. Lead abatement work in these facilities is beyond the scope of this program. Contact OSEH for additional information.

b. Identify of suspect, known or assumed LCMs.

c. Evaluate suspect LCMs for lead content.

d. Conduct training and medical surveillance of workers with probable exposure to lead.

e. Plan and use of engineering controls, work practices, personal protective equipment, waste handling and disposal procedures to minimize and control exposures to lead.

f. Air monitor procedures effecting LCM to evaluate actual exposures and the effectiveness of controls.

g. Follow up air monitoring, medical surveillance and testing of materials, surfaces or waste, as necessary.

3. These general procedures should be followed for both construction and non-construction activities.

B. Identification and Testing of Potentially Suspect LCM

1. Prior to the beginning of a project or process that will impact the condition of a potentially suspect LCM, identification of lead content must be done. The project or process materials must be listed and inventoried. Listed items will be considered:

   a. non-lead, based on previous evidence, testing or content information; or

   b. lead containing, based on previous evidence, testing or content information; or

   c. suspect lead containing, which must be evaluated by testing for lead content or assumed to be lead containing and treated as such.

2. Listing, inventorying, evaluating and testing of potentially suspect LCM will be done through the University’s OSEH Department. Coordination of all of these activities must be handled through OSEH.

3. Two analytical methods of identifying lead content are presently acceptable. Other or additional methods for identifying or quantifying the lead content of materials may be used only if approved by OSEH.

   a. Laboratory analysis for total lead content by atomic absorption spectroscopy (AAS), inductively coupled plasma (ICP), or other similar method as developed by a recognized analytical laboratory, to determine the exact percentage of lead present. The accepted
limit of detection for these methods should be 0.06% total lead by weight.

b. Field testing with a qualitative wet chemistry method from commercial vendors, such as Lead Check or Lead Alert, to confirm the presence of lead. These methods can only be used to confirm the presence of lead. A negative result with these methods must be confirmed by laboratory analysis using methods stated in paragraph a. above.

3. Articles and materials that should be considered possibly suspect for containing lead include, but are not limited to:
   a. paints and coatings;
   b. plumbing joints and solder;
   c. ceramics;
   d. leaded glass;
   e. soundproofing materials;
   f. radiation shielding; and
   g. piping and metals.

4. Prior knowledge or information available on the lead content of a material, or lack thereof, may be used to evaluate the need for further testing for lead content.

5. Specific methods and procedures for collecting samples and conducting tests are outlined in Appendix A of this program.

C. Activities Requiring Control Measures

1. All activities that will affect the physical integrity of a suspect or known LCM, or cause the production of a dust, fume or other aerosol that could contain lead, must use adequate control measures to minimize worker exposures to lead and lead emissions to the inside or outside environment.

2. Specific activities effecting known, assumed or suspect LCM that are considered to require exposure and emission control measures include, but are not limited to:
   a. sanding;
   b. scraping;
   c. cutting;
   d. grinding;
   e. welding;
   f. demolition;
   g. drilling;
   h. using a heat gun or other thermal removal process;
   i. sand or abrasive blasting or cleaning;
   j. melting, forming or forging lead containing metals;
   k. milling or machining lead containing materials, parts or articles;
   l. applying lead containing paints or coatings; and
   m. handling lead containing metals with a significant amount of oxidation.
3. Technologies Considered Able to Control Exposures Below the PEL

a. The technologies listed below are considered able to maintain employee exposures to lead aerosols to levels below the PEL.

i. Power tools equipped with dedicated local exhaust dust collection with HEPA filtration.

ii. Removal of entire structures without impacting the integrity of the LCM.

iii. Covering and enclosing LCM with solid materials capable of preventing the LCM from being physically damaged or creating an aerosol.

iv. Complete containment of the activities affecting the LCM within an enclosed local exhaust ventilated and HEPA filtered space isolated from the workers’ breathing zone (e.g., working inside of a negative pressure glove box).

b. The control measures listed above must be routinely evaluated for effectiveness and reliability. Evaluations will include air monitoring at least once annually.

D. Controls, Work Procedures and Protective Equipment

1. General

a. While all potential exposures to lead aerosols must be controlled, different techniques may be used depending on the specific activity or situation. The preferred method of exposure control is engineering (e.g., local ventilation). If engineering controls are not feasible or adequate to reduce exposures to acceptable levels, then special work practices and personal protective equipment must be used.

b. Activities can be generally considered to fall into one of three categories:

i. Category I: Small scale short duration activities including minor repair work such as patching, drilling or demolition work that can be completed in less than one hour. Welding, heat gun use or other thermal processes, milling, machining and forging activities on lead containing metals or materials, and abrasive blasting cannot be considered Category I activities, no matter the size or duration of the project.

ii. Category II: Activities lasting one hour or longer, that have a potential for exposure at the AL but below the PEL, or activities being initially evaluated for exposure levels. Includes most construction work involving sanding, scraping, cutting, grinding, welding and demolition, milling, machining and forging activities on lead containing metals or materials, and applying of lead containing paint or coatings.

iii. Category III: Abrasive blasting and activities that have been shown to potentially exceed the PEL.
c. Controls, work practices and PPE to be used or omitted on any activities impacting LCM must be in accordance with this program or have prior approval of OSEH.

d. Air Monitoring

i. In all potential lead exposure situations, air monitoring must be done both initially and at regular intervals, depending on the results of previous or initial air monitoring, or the amount of time since the activity was monitored in the past. All air monitoring for lead exposure will be handled through OSEH.

ii. If a negative exposure determination is made for a specific activity, then air monitoring may cease until there is a change in control methods, equipment, work practices or personnel, at which point air monitoring will resume.

2. Category I

a. Preparation

Prepare the work area in a manner that will protect building occupants and property from contact with LCM. When previous or existing surface contamination of floors, furniture, and other items is suspected, surface contamination shall be removed by HEPA vacuuming or wet wiping with a soap solution.

i. Building Interiors: Cover all non-working horizontal surfaces within 10 feet of the work area with plastic sheeting. As necessary to control work area dust, discontinue building ventilation within the work area and seal off the ventilation supply and return or exhaust diffusers, grilles or openings.

ii. Building Exteriors: Cover the ground and vegetation with plastic sheeting within 10 feet of the work area and with the free ends secured in position with stakes, tie-down lines or weights. Cover sufficient ground area to capture wind-blown chips, dust and particles.

iii. Restrict access to the work area to trained and essential personnel only.

b. Personal Protective Equipment

i. Each employee in the work area shall wear respiratory protection with a protection factor equivalent to or higher than a half-face negative pressure respirator equipped with HEPA filters. The need for higher levels of respiratory protection will be dictated by monitoring results, or the type of work activity prior to obtaining air monitoring results. Each employee who wears a respirator shall participate in the Respiratory Protection Program and have been issued their respirator through OSEH where appropriate fit testing and training is conducted.
ii. Hand, eye and face protection, and protective coveralls will be used as necessary to protect workers from contamination, irritation or other injuries.

iii. Employees will wash hands and face upon leaving the work area. Eating and drinking in the work area is prohibited.

c. Work Methods Related to Specific Operations

i. Surface Prep for Removal or Repairing Painted Surfaces:

- Remove paint from surfaces by hand scraping and sanding.
- Wet removal methods using misted water should always be used in conjunction with hand scraping and sanding. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground or adjacent surfaces. Sanding of painted surfaces should be minimized as much as possible.
- Dry removal methods such as power sanding or other methods relying on high velocity mechanical abrasion that create fine airborne dusts, fumes or particulates are prohibited unless done in conjunction with a dedicated local exhaust ventilation system or vacuum system with HEPA filtration. OSEH will be consulted when designing control methods.
- Power washing of exterior surfaces is prohibited, unless approved by OSEH.
- Chemical stripping methods will not be used unless first approved by OSEH due to the additional separate hazards associated with using chemical strippers.

ii. Demolition:

- Perform demolition operations in a manner that does not contaminate the work area or generate airborne dust and particles unnecessarily.
- Remove and stockpile materials in the largest sections possible. Do not separate lead sheet materials that are adhesively laminated to gypsum substrates.
- Wet methods for dust control using misted water should always be used in conjunction with demolition. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground, floor or adjacent surfaces.

d. Clean Up

i. After removal of waste, clean work tools/equipment, and clean all potentially contaminated surfaces within the work area. Include, as necessary, the following surfaces:

- siding
- floors
- walls
• window sills
• trim
• ledges and projections

ii. Use a solution of soap or detergent to wash surfaces or use a HEPA filter vacuum or other method that minimizes the likelihood of lead becoming airborne.

iii. Wash hands and face with soap and water immediately after completing work and before taking breaks. Clean all respirators, inside and out, with a mild soap and water solution daily and at the end of the project.

e. Air Monitoring

i. Representative air monitoring must be conducted initially for all Category I activities, and subsequent to initial monitoring at least annually. OSEH will coordinate this monitoring upon notification of the planned work.

ii. At any time worker exposure levels are found to be above the AL, the activity being monitored will stop and be reevaluated for potential problems. This activity will shift to Category II and regular air monitoring will continue at least twice per week until two consecutive air monitoring results within a 7-day period for that activity are shown to be below the AL.

iii. At any time worker exposure levels are found to above the PEL, the activity being monitored will stop and be reevaluated for potential problems. This activity will shift to Category III and regular air monitoring will continue at least twice per week until two consecutive air monitoring results within a 7-day period for that activity are shown to be below the AL.

f. Staffing

All workers must be trained for lead compliance as outlined in this program. At least one worker must be a competent person. If only one employee is conducting work activities, then this worker must be a competent person.

3. Category II

a. Preparation

Prepare the work area in a manner that will protect building occupants and property from contact with LCM. When previous or existing surface contamination of floors, furniture, and other items is suspected, surface contamination shall be removed by HEPA vacuuming or wet wiping with a soap solution.

i. Building Interiors: Construct critical barriers and seal off openings and penetrations into the work area, including doorways and windows. Use plastic sheeting on wood studs if necessary; lap and tape joints of plastic sheeting to prevent LCM dust, particles, fumes or other aerosols from
leaving the enclosed area. As necessary to control work area dust, discontinue building ventilation within the work area and seal off the ventilation supply and return or exhaust diffusers, grilles or openings.

ii. Building Exteriors: Erect barricades and install warning tape or signs as necessary to help prevent inadvertent exposure of passersby to LCM in all forms including dust, particles and fumes. Completely cover the ground and vegetation with 8-mil thick plastic sheets with joints between sheets lapped and taped; with one edge taped to adjacent building surfaces below area of work; and with free ends secured in position with stakes, tie-down lines or weights. Cover sufficient ground area to capture wind-blown chips, dust and particles.

iii. Restrict access to the work area to trained and essential personnel only.

b. Personal Protective Equipment

i. Unless work involves initial monitoring of welding, heat gun use or other thermal processes, or abrasive blasting activities, each employee in the work area shall wear respiratory protection with a protection factor equivalent to or higher than a half-face negative pressure respirator equipped with HEPA filters. If work involves initial monitoring of welding, heat gun use or other thermal processes, or abrasive blasting activities, each worker will wear respiratory protection with a protection factor equivalent or higher to a tight fitting full-face air filtering respirator with HEPA filter cartridges. The need for higher or lower levels of respiratory protection will be dictated by monitoring results. Each employee who wears a respirator shall participate in the Respiratory Protection Program and have been issued their respirator through OSEH where appropriate fit testing and training is conducted.

ii. Disposable protective coveralls including head covers, gloves, and foot covers shall be worn. Protective clothing will be removed inside the work area and when the work area is exited. Disposable coveralls will be replaced at least daily or when the garment becomes worn to provide protection.

iii. Hand, eye and face protection will be used as necessary to protect workers from irritation or other injuries.

iv. Employees will wash hands and face upon leaving the work area. Eating and drinking in the work area is prohibited.

c. Work Methods Related to Specific Operations

i. Surface Prep for Removal or Repairing Painted Surfaces:

• Remove paint from surfaces by hand scraping and sanding.
• Wet removal methods using misted water should always be used in conjunction with hand scraping and
sanding. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground or adjacent surfaces. Sanding of painted surfaces should be minimized as much as possible.

- Dry removal methods such as power sanding, heat gun removal, welding, or other methods relying on high velocity mechanical abrasion that create fine air borne dusts, fumes or particulates are prohibited unless done in conjunction with a dedicated local exhaust ventilation system or vacuum system with HEPA filtration. OSEH will be consulted when designing control methods. Abrasive blasting removal is prohibited.
- Power washing of exterior surfaces is prohibited, unless approved by OSEH.
- Chemical stripping methods will not be used unless first approved by OSEH due to the separate additional hazards associated with using chemical strippers.

ii. Demolition:

- Perform demolition operations in a manner that does not contaminate the work area and generate airborne dust and particles unnecessarily.
- Remove and stockpile materials in the largest sections possible. Do not separate lead sheet materials that are adhesively laminated to gypsum substrates.
- Wet methods for dust control using misted water should always be used in conjunction with demolition. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground, floor or adjacent surfaces.
- Welding, Burning and Hot Work: When performing these operations in building interiors, adequate local exhaust ventilation to draw lead fumes away from the employee's breathing zone must be utilized. OSEH will be consulted when designing control methods.

iii. Welding, Heat Gun Use or Other Thermal Processes, Abrasive Blasting, Melting, Forging and Machining:

- These operations will only be done in conjunction with local exhaust ventilation to draw fumes away from the worker’s breathing zone, adequate respiratory protection, and control of air emissions to areas outside of the work area.
- Non-construction related activities must use engineering controls installed to keep exposures below the PEL, and the performance of the engineering controls must be checked quarterly.
d. Clean Up

i. After removal of waste, clean work tools/equipment, and clean all potentially contaminated surfaces within the work area. Include, as necessary, the following surfaces:
   - siding
   - floors
   - walls
   - window sills
   - trim
   - ledges and projections

ii. Use a solution of soap or detergent to wash surfaces or use a HEPA filter vacuum or other method that minimizes the likely hood of lead becoming airborne.

iii. Shower, or wash hands and face with soap and water immediately after completing work and before taking breaks. Clean all respirators, inside and out, with a mild soap and water solution daily and at the end of the project.

e. Air Monitoring

i. Representative air monitoring must be conducted initially for all Category II activities, and subsequent to initial monitoring at least once every six months. OSEH will coordinate this monitoring upon notification of the planned work.

ii. At any time worker exposure levels are found to above the PEL, the activity being monitored will stop and be reevaluated for potential problems. This activity will shift to Category III and regular air monitoring will continue at least twice per week until two consecutive air monitoring results within a 7 day period for that activity are shown to be below the AL.

f. Staffing

All workers must be trained for lead compliance as outlined in this program. At least two workers will be onsite while work is in progress and at least one worker must be a competent person.

3. Category III

a. Preparation

Prepare the work area in a manner that will protect building occupants and property from contact with LCM. When previous or existing surface contamination of floors, furniture, and other items is suspected, surface contamination shall be removed by HEPA vacuuming or wet wiping with a soap solution.

i. Building Interiors: Construct double layer full containment of floors, walls, ceilings and seal off openings and penetrations into the work area, including doorways and windows. Only the surfaces of materials to be effected by
actual work should remain uncovered. Use plastic sheeting on wood studs if necessary. Lap and tape joints of plastic sheeting to prevent LCM dust, particles or fumes from leaving the containment area. As necessary to control work area dust, discontinue building ventilation within the work area and seal off the ventilation supply and return or exhaust diffusers, grilles or openings. Install a HEPA filtered filtration unit exhausted to the outside of the building in order to keep the containment under continuous negative air pressure.

ii. Building Exteriors: Completely cover the ground and vegetation with 8-mil thick plastic sheets with joints between sheets lapped and taped; with one edge taped to adjacent building surfaces below area of work; and with free ends secured in position with stakes, tie-down lines or weights. Cover sufficient ground area to capture wind-blown chips, dust and particles. Erect barricades and install warning tape or signs as necessary to help prevent inadvertent exposure of passersby to LCM in all forms including dust, particles and fumes.

iii. Restrict access to trained and essential personnel only.

iv. Erect warning signs around all areas of the containment and work area. Warning signs must say:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

b. Personal Protective Equipment

i. Unless work involves initial monitoring of welding, heat gun use or other thermal processes, or abrasive blasting activities, each employee in the work area shall wear respiratory protection with a protection factor equivalent to or higher than a half-face negative pressure respirator equipped with HEPA filters. If work involves initial monitoring of welding, heat gun use or other thermal processes, or abrasive blasting activities, each worker will wear respiratory protection with a protection factor equivalent or higher to a tight fitting full-face air filtering respirator with HEPA filter cartridges. The need for higher or lower levels of respiratory protection will be dictated by monitoring results. Each employee who wears a respirator shall participate in the Respiratory Protection Program and have been issued their respirator through OSEH where appropriate fit testing and training is conducted.

ii. Disposable protective coveralls including head covers, gloves, and foot covers shall be worn. Protective clothing will be removed inside the work area and when the work area is exited. Disposable coveralls will be replaced at least daily or when the garment becomes to worn to provide protection.
iii. Hand, eye and face protection will be used as necessary to protect workers from irritation or other injuries.

iv. Employees will wash hands and face upon leaving the work area. Eating and drinking in the work area is prohibited.

c. Work Methods Related to Specific Operations

i. Surface Prep for Removal or Repairing Painted Surfaces:

- Remove paint from surfaces by hand scraping and sanding.
- Wet removal methods using misted water should always be used in conjunction with hand scraping and sanding. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground or adjacent surfaces. Sanding of painted surfaces should be minimized as much as possible.
- Dry removal methods such as power sanding, heat gun removal, welding, or other methods relying on high velocity mechanical abrasion that create fine airborne dusts, fumes or particulates are prohibited unless done in conjunction with a dedicated local exhaust ventilation system or vacuum system with HEPA filtration. OSEH will be consulted when designing control methods. Abrasive blasting removal is prohibited.
- Power washing of exterior surfaces is prohibited, unless approved by OSEH.
- Chemical stripping methods will not be used unless first approved by OSEH due to the additional hazards associated with chemical strippers.

ii. Demolition:

- Perform demolition operations in a manner that does not contaminate the work area and generate airborne dust and particles unnecessarily.
- Remove and stockpile materials in the largest sections possible. Do not separate lead sheet materials that are adhesively laminated to gypsum substrates.
- Wet methods for dust control using misted water should always be used in conjunction with demolition. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground, floor or adjacent surfaces.
- Welding, Burning and Hot Work: When performing these operations in building interiors, adequate local exhaust ventilation to draw lead fumes away from the employee's breathing zone must be utilized. OSEH will be consulted when designing control methods.
iii. Welding, Heat Gun Use or Other Thermal Processes, Abrasive Blasting, Melting, Forging and Machining:

- These operations will only be done in conjunction with local exhaust ventilation to draw fumes away from the worker’s breathing zone, adequate respiratory protection, and control of air emissions to areas outside of the work area.
- Non-construction related activities must use engineering controls installed to keep exposures below the PEL, and the performance of the engineering controls must be checked quarterly.

d. Clean Up

i. After removal of waste, clean work tools/equipment, and clean all potentially contaminated surfaces within the work area. Include, as necessary, the following surfaces:
   - siding
   - floors
   - walls
   - window sills
   - trim
   - ledges and projections

ii. Use a solution of soap or detergent to wash surfaces or use a HEPA filter vacuum or other method that minimizes the likely hood of lead becoming airborne.

iii. Shower, or wash hands and face with soap and water immediately after completing work and before taking breaks. Clean all respirators, inside and out, with a mild soap and water solution daily and at the end of the project.

e. Air Monitoring

i. Representative air monitoring must be conducted initially for all Category III activities. Regular air monitoring will continue at least twice per week until two consecutive air monitoring results within a 7 day period for that activity are shown to be below the AL. OSEH will coordinate this monitoring upon notification of the planned work.

ii. At any time worker exposure levels are found to above ten times (10x) the PEL, the activity being monitored will stop and be reevaluated for potential problems. Additional engineering controls, work practices and PPE will be instituted to control worker exposure.

f. Staffing

i. All workers must be trained for lead compliance as outlined in this program. At least two workers will be onsite inside of the containment while work is in progress, at least one other worker will be onsite outside of the containment while work is in progress, and at least one worker must be a competent person. Communication between workers inside
and outside of the containment will be maintained throughout the project.

ii. All workers on projects in residential areas or child care facilities will be trained in accordance with EPA regulations as outlined in the training section of this program.

E. Training and Medical Surveillance

1. Training
   a. Workers and supervisors doing work in residential areas or child care facilities will be trained in an EPA approved course that meets the requirements of 40 CFR Part 745. These workers and supervisors will also maintain any additional certifications and attend refresher training as required by 40 CFR Part 745, and subsequent Federal and state regulations.
   
   b. All employees falling within the scope of this program work must participate in an annual lead training program. OSEH will provide training, which will include the following elements:
      
      i. The health hazards of lead
      ii. The content of 1926.26 and its appendices
      iii. Lead Identification procedures
      iv. The procedures covered in this program
      v. the procedures for using respirators and other PPE.
      vi. The purpose of the medical surveillance program and restrictions on chelation
      vii. The personnel monitoring procedure and their right of access to employee records.
      viii. An overview of RCRA, as it applies to lead waste, and the disposal methods included herein.

2. Medical Surveillance

   All workers included in the scope of this program will also participate in the necessary aspects of the Medical Surveillance Program. This will include annual physician’s examinations, biological testing and medical removal protection.

F. Waste Handling

1. For work other than demolition, collect all LCM contaminated waste in leak tight containers. Roll plastic sheeting up in a manner that captures all waste inside sheeting and place in 4-6 mil thick plastic bags and seal in a manner that prevents leakage or spillage. If LCM is water saturated, place in doubled layer plastic bags. Plastic sheeting that has not been contaminated or that has been cleaned with a HEPA vacuum may be disposed as normal waste.

2. All disposable personal protective equipment worn during work in the work area will be disposed of in plastic bags with other LCM waste.
3. Liquid LCM waste will be placed in pails or drums with leak-proof covers.

4. Demolition waste cannot be discarded as regular waste until approved by OSEH. Additional testing of the waste may be required. Collect and cover demolition waste on site until the method of disposal has been determined. Contact OSEH for proper procedures.

5. Use preprinted labels on all containers of lead containing waste. Complete required information on the label: Name of contact person knowledgeable of the waste, building and room number where the waste was generated, and date (see Appendix B).

6. Secure the LCM waste in an appropriate location in the building or area it was generated. LCM must not leave the building until picked up by OSEH HazMat. Coordinate a secure storage location before work begins. Contact OSEH to arrange pickup of the waste.

G. Recordkeeping

1. Site Specific Documentation
   a. A Lead Compliance Checklist (see Appendix D) will be completed at the beginning of work for each project that falls within the scope of this program. A subsequent checklist will be completed at least once weekly for projects lasting longer than one week, or whenever procedures, controls or equipment changes, or whenever air monitoring is conducted.

   b. Copies of the compliance checklist for each project will be kept at the work site until the project is completed. Once the project is completed, copies of all checklists, air monitoring results, waste manifests, and all other relevant documents and information will be consolidated and forwarded to OSEH.

2. General Records
   a. All air monitoring results will be compiled and cross indexed by worker name, activity and location. Written copies of representative air monitoring results will be supplied to each worker for each project or site air monitored within 5 days of receipt. All site specific documentation will have copies stored at OSEH.

   b. All essential medical surveillance information will be stored at OSEH. Other medical surveillance records will be kept at the medical clinic under control of a physician.

   c. Written opinions of medical surveillance and biological monitoring results will be given to individual employees as they are received and within 5 days of receipt.
APPENDIX A
Acceptable Sampling and Analysis Methods for Lead

1. The following sampling and analysis methods are considered acceptable for determining the amount of lead present in either a bulk, wipe or air sample.

   NIOSH Methods 7082, 7105, 7300 and 9100
   OSHA Methods 121, 125G and 206

   Not all methods are acceptable for all matrices (i.e., bulk, wipe and air). The correct sampling method must be selected based on the matrix sampled and the data desired.

2. Some qualitative methods may also be used. Qualitative methods can not be used when qualitative results are required. These methods will only be used for screening or as an initial test to supplement the quantitative methods listed above.

   NIOSH Method 7700
   Lead Check test swabs

3. Any questions regarding acceptable sampling and analysis methods should be directed to OSEH (764-3141).
APPENDIX C
# Requirements for Controlling Worker Exposures to Lead Aerosols during Construction Activities

<table>
<thead>
<tr>
<th>During Initial Assessment of Lead Related Tasks</th>
<th>For Specific Lead Aerosol Exposure Levels*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regardless of Exposure Level</td>
</tr>
<tr>
<td></td>
<td>Regardless of Exposure Level</td>
</tr>
<tr>
<td>Increased respiratory protection (1926.62(d)(2) &amp; 1926.62(f))</td>
<td>Exposure assessment and interim protection (1926.62(d))</td>
</tr>
<tr>
<td>Protective clothing and equipment (1926.62(g))</td>
<td>Housekeeping (1926.62(h))</td>
</tr>
<tr>
<td>Changing areas (1926.62(i)(2))</td>
<td>Handwashing facilities (1926.62(i)(5))</td>
</tr>
<tr>
<td>Handwashing facilities (1926.62(i)(5))</td>
<td>Hazard communication training (1926.62(l)(1)(i))</td>
</tr>
</tbody>
</table>

* Requirements are progressive and include those listed in columns for lower exposures to the left. Regulatory citations are all 29 CFR.
# Quick Reference Lead Compliance Activity Summary Table

<table>
<thead>
<tr>
<th>Planning Phase</th>
<th>Work Phase</th>
<th>Follow-up Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine Building Age and Presence of Target Housing or Child-occupied Facilities (If present and built before 1978, then work must be done by state certified workers.)</td>
<td></td>
<td>Inspect for Remaining Contamination</td>
</tr>
<tr>
<td>Identify Suspect, Known and Assumed LCM</td>
<td>Pre-cleaning</td>
<td>Conduct Follow-up Medical Surveillance, as necessary</td>
</tr>
<tr>
<td>Evaluate Suspect LCM for Lead Content</td>
<td>Remove Moveable Articles</td>
<td>Conduct Necessary Waste Testing</td>
</tr>
<tr>
<td>Determine Level of Work (i.e., Category I, II or III)</td>
<td>Cover Horizontal Surfaces</td>
<td>Have Waste Picked-up for Disposal</td>
</tr>
<tr>
<td>Conduct Training and Medical Surveillance</td>
<td>Use PPE (respirator, head, body and foot covers, eye and face protection)</td>
<td></td>
</tr>
<tr>
<td>Coordinate Engineering Controls, Work Practices, PPE, Air Monitoring and Waste Handling and Storage</td>
<td>Restrict Access to Work Area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use Wet Methods and HEPA Filtration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand Washing Facilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conduct Initial and Periodic Air Monitoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collect and Containerize Waste</td>
<td></td>
</tr>
<tr>
<td><strong>Pre-cleaning</strong></td>
<td><strong>Pre-cleaning</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Remove Moveable Articles</strong></td>
<td><strong>Remove Moveable Articles</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Cover Horizontal Surfaces</strong></td>
<td><strong>Cover Horizontal Surfaces</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Use PPE (respirator, head, body and foot covers, eye and face protection)</strong></td>
<td><strong>Erect Critical Barriers</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Restrict Access to Work Area</strong></td>
<td><strong>Use and Replace PPE Daily</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Use Wet Methods and HEPA Filtration</strong></td>
<td><strong>Restrict Access to Work Area</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Hand Washing Facilities</strong></td>
<td><strong>Post Warning Signs</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Conduct Initial and Periodic Air Monitoring</strong></td>
<td><strong>Use Wet Methods and HEPA Filtration</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Collect and Containerize Waste</strong></td>
<td><strong>Showers and Personal Hygiene Facilities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Inspect for Remaining Contamination</strong></td>
<td><strong>Conduct Initial and Regular Air Monitoring</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Conduct Follow-up Medical Surveillance, as necessary</strong></td>
<td><strong>Conduct Clearance Monitoring, As Necessary</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Conduct Necessary Waste Testing</strong></td>
<td><strong>Collect and Containerize Waste</strong></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D
Lead Compliance Checklist

Location: ____________________________________________________ Date: _____________

I Activity Category: I ___ II ___ III ___ Yes No NA

II Preparation
  a. Hand Washing Facility Available (all categories) ___ ___ ___
  b. Change Area Available (category III only) ___ ___ ___
  c. Shower Available (category III only) ___ ___ ___
  d. Lunch Area Available (category III only) ___ ___ ___

III Work Area
  a. Pre-cleaning Done (all categories) ___ ___ ___
  b. Movable Objects Removed (all categories) ___ ___ ___
  c. Non-working Horizontal Surfaces Covered (all categories) ___ ___ ___
  d. Critical Barriers Erected (categories II and III) ___ ___ ___
  e. Ventilation Systems Covered (all categories) ___ ___ ___
  f. Full Containment Erected (category III only) ___ ___ ___
  g. Negative Pressure Established (category III only) ___ ___ ___
  h. Access Restricted (all categories) ___ ___ ___
  i. Barricades Erected (outdoors, categories II and III) ___ ___ ___
  j. Warning Signs Posted (category III only) ___ ___ ___

IV Exposure Controls
  a. Dust Control Used (e.g., water) (all categories) ___ ___ ___
  b. HEPA Vacuums Used (all categories) ___ ___ ___
  c. HEPA Filtered Local Exhaust Ventilation Used (hot work activities) ___ ___ ___
  d. Respiratory Protection Used (all categories) ___ ___ ___
    List Type(s): __________________________________________________________
  e. Disposable Coveralls Used (all categories) ___ ___ ___
  f. Head and Foot Covers Used (all categories) ___ ___ ___
  g. Other PPE Used (list): _____________________________________________ ___ ___ ___

V LCM Affected (all categories, be specific)
  Amt: __________ Desc: ________________________ Loc: _________________________
  Amt: __________ Desc: ________________________ Loc: _________________________
  Amt: __________ Desc: ________________________ Loc: _________________________
  Amt: __________ Desc: ________________________ Loc: _________________________

VI Clean-up
  a. Waste Material Collected in Leak Tight Containers (all categories) ___ ___ ___
  b. Barrier Materials Cleaned or Handled as LCM Waste (all categories) ___ ___ ___
  c. PPE cleaned or disposed of as LCM Waste (all categories) ___ ___ ___
  d. Waste Materials Stored Onsite for HazMat Pick-up (all categories) ___ ___ ___
  e. Waste Containers Properly Labeled (all categories) ___ ___ ___

VII Workers and Personal Monitoring (all categories) (Include additional workers on a separate page.)

<table>
<thead>
<tr>
<th>Name</th>
<th>Number</th>
<th>Air Monitoring Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
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<tr>
<td>d.</td>
<td></td>
<td></td>
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<tr>
<td>e.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name: _________________________________ Signature: ______________________________

LeadChecklist2.doc  5/25/00
Instructions

Complete the heading of the form and select the appropriate category for the project or activities being documented.

Category Selection

Category I Projects/Activities: Small scale short duration activities including minor repair work such as patching, drilling or demolition work that can be completed in less than one hour. Welding, heat gun use or other thermal processes, milling, machining and forging activities on lead containing metals or materials, and abrasive blasting cannot be considered Category I activities, no matter the size or duration of the project.

Category II Projects/Activities: Activities lasting one hour or longer, that have a potential for exposure at the action level (AL) but below the permissible exposure limit (PEL), or activities being initially evaluated for exposure levels. Includes most construction work involving sanding, scraping, cutting, grinding, welding and demolition, milling, machining and forging activities on lead containing metals or materials, and applying of lead containing paint or coatings.

Category III Projects/Activities: Abrasive blasting or activities that have been shown to potentially exceed the PEL.

Once the activity has been categorized, proceed through the check list marking each item either “Yes”, “No” or not applicable (“NA”). Typically, each item on the checklist that is noted as applying to a certain category of work should be followed and checked “Yes”. If for some reason an applicable item is not checked “Yes”, then a reason or comment why that item was not followed should be included on the checklist. For example, item III.a. “Pre-cleaning” applies to all categories, but it probably wouldn’t be done if the project is a clean-up of flaking paint debris.

Be sure to include accurate descriptions of the LCM impacted by the work and the names of all of workers exposed to LCM during the project. If personal air monitoring is conducted for the project that day, enter the results on the line corresponding to the worker monitored.

The checklist should be started at the beginning of each workday or shift and be completed by the end of each workday or shift.

If a project includes more than one work site, or activities which fall into different categories, or use different control measures or workers, then a separate checklist should be completed for each work site or activity.

Once work is completed for the day, the checklist should be signed by the competent person for the project. Checklists should be kept on file until the project is completed, and then forwarded to OSEH.

If there are any questions about this checklist, the proper procedures or controls that should be used, or any other safety or health issues concerning lead containing materials, contact OSEH at 764-3141 or 647-1142.
LEAD COMPLIANCE TRAINING PROGRAM

FOR

THE UNIVERSITY OF MICHIGAN

The Department of Occupational Safety and Environmental Health
Campus Safety Services Building
1239 Kipke Drive
Ann Arbor, Michigan 48109-1010
# LEAD TRAINING PROGRAM

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**APPENDIX A**
- Quick Reference Compliance Tables and Lead Compliance Checklist

**APPENDIX B**
- Lead Check Swab Use Instructions

**APPENDIX C**
- Lead Containing Waste Labels
LEAD COMPLIANCE TRAINING PROGRAM

I. LEAD COMPLIANCE PROGRAM OVERVIEW

A. The Lead Compliance Program documents the scope, purpose, identification, work and disposal procedures to be used by Plant Operations Division personnel on all projects that may affect lead containing materials (LCM).

B. All projects that will affect LCM are broken down into three (3) categories, based on the scope of the project, the work affecting the LCM, the work practices to be used during the project, and the types of occupants expected to occupy the project area after the project is completed. The specifics of each category are as follows:

1. Category I:

   Small scale short duration activities lasting less than one hour, such as minor repair work, patching, drilling, or demolition of materials containing lead. This category is intended to include maintenance work where the disturbance of LCM is incidental to the work being performed and work that takes place in limited areas or for short periods of time. Abrasive blasting, welding or other forms of hot work procedures on LCM are not included in this category.

2. Category II:

   Larger or longer duration activities, such as construction work, sanding, scraping, cutting, grinding, welding, demolition or spray painting with lead-containing coatings that have a potential for exposing workers at or above the Action Level (AL) (30 µg/m³), but below the Permissible Exposure Limit (PEL) (50 µg/m³). Abrasive blasting activities on LCM are not included in this category.

3. Category III:

   Activities similar to Category II operations, except that worker exposures are probable to be at or above the PEL or the process involves abrasive blasting.

C. Activities that occur in residential type housing or child-occupied facilities built before 1978 require workers to have more extensive training than what is covered in this training program.

II. SUBSTANCE IDENTIFICATION

A. General.

   1. Substance: Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

   2. Compounds Covered by the Standard: The word "lead" when used in this interim final standard means elemental lead, all inorganic lead compounds
and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

3. Uses: Exposure to lead occurs in several different occupations in the construction industry, including demolition or salvage of structures where lead or lead-containing materials are present; removal or encapsulation of lead-containing materials, new construction, alteration, repair, or renovation of structures that contain lead or materials containing lead; installation of products containing lead. In addition, there are construction related activities where exposure to lead may occur, including transportation, disposal, storage, or containment of lead or materials containing lead on construction sites, and maintenance operations associated with construction activities.

4. Permissible Exposure Limit: The permissible exposure limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 µg/m³), averaged over an 8-hour workday.

5. Action Level: The interim final standard establishes an action level of 30 micrograms of lead per cubic meter of air (30 µg/m³), averaged over an 8-hour workday. The action level triggers several ancillary provisions of the standard such as exposure monitoring, medical surveillance, and training.

6. Exposure of workers, occupants or the environment to lead or lead containing materials (LCM) are to kept as low as practical without creating additional or more severe hazards.

7. As a general process, the control of LCM will follow the sequence:
   a. Identification of suspect, known or assumed LCMs.
   b. Evaluation of suspect LCMs for lead content.
   c. Training and medical surveillance of workers with probable exposure to lead.
   d. Planning and use of engineering controls, work practices, personal protective equipment, waste handling and disposal procedures to minimize and control exposures to lead.
   e. Air monitoring of procedures effecting LCM to establish actual exposure levels and effectiveness of controls.
   f. Follow up air monitoring, medical surveillance and testing of materials, surfaces or waste, if necessary.

8. These general procedures should be followed for both construction and non-construction activities.

B. Identification and Testing of Potentially Suspect LCM

1. Prior to the beginning of a project or process that will impact the condition of a potentially suspect LCM, identification of lead content must be done.
The project or process materials must be listed and inventoried. Listed items will be considered: non-lead, based on previous evidence, testing or content information; lead containing, based on previous evidence, testing or content information; or suspect lead containing, which must be evaluated by testing for lead content or assumed to be lead containing and treated as such.

2. Listing, inventorying, evaluating and testing of potentially suspect LCM will be done through the University’s OSEH Dept. Coordination of all of these activities must be handled through OSEH.

3. Two analytical methods of identifying lead content are acceptable:
   a. Laboratory analysis for total lead content by atomic absorption spectroscopy (AAS), inductively coupled plasma (ICP), or other similar method as developed by a recognized analytical laboratory, to determine the exact percentage of lead present. The accepted limit of detection for these methods should be 0.06% total lead by weight.
   b. Field testing with a qualitative wet chemistry method from commercial vendors, such as Lead Check or Lead Alert, to confirm the presence of lead. These methods can only be used to confirm the presence of lead. A negative result with these methods must be confirmed by laboratory analysis using methods stated in paragraph a. above.

3. Articles and materials that should be considered possibly suspect for containing lead include: paints and coatings; plumbing joints and solder; ceramics; leaded glass; soundproofing materials; radiation shielding; piping and metals.

4. Prior knowledge or information available on the lead content of a material, or lack thereof, may be used to evaluate the need for further testing for lead content.

5. Specific methods and procedures for collecting samples and conducting tests are outlined in Appendix A of this program.

C. Activities Requiring Control Measures

1. All activities that will affect the physical integrity of a suspect or known LCM, or cause the production of an aerosol that could contain lead, must use adequate control measures to minimize worker exposures and lead emissions.

2. Specific activities that are considered to require control measures include: sanding; scraping; cutting; grinding; welding; demolition; drilling; using a heat gun or other thermal removal process; sand or abrasive blasting or cleaning; melting, forming or forging lead containing metals; milling or machining lead containing materials, parts or articles; applying lead containing paints or coatings; and handling lead containing metals with a significant amount of oxidation.
3. Technologies Considered Able to Control Exposures Below the PEL

The technologies listed below are considered able to maintain employee exposures to lead aerosols to levels below the PEL.

a. Power tools equipped with dedicated local exhaust dust collection with HEPA filtration.

b. Removal of entire structures without impacting the integrity of the LCM.

c. Covering and enclosing LCM with solid materials capable of preventing the LCM from being physically damaged or creating an aerosol.

d. Complete containment of the activities effecting the LCM within an enclosed local exhaust ventilated and HEPA filtered space isolated from the workers’ breathing zone (e.g., working inside of a negative pressure glove box).

III. HEALTH HAZARD INFORMATION

A. Ways in which lead enters your body: When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed. Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume, or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion. A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

B. Effects of overexposure to lead

1. Short-term (acute) overexposure: Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term
occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

2. **Long-term (chronic) overexposure:** Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain. Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy. Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible. Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.

3. **Health protection goals of the standard.**

   a. Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that a worker's blood lead level (BLL, also expressed as PbB) be
maintained at or below forty micrograms per deciliter of whole blood (40 µg/dl). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 µg/dl to minimize adverse reproductive health effects to the parents and to the developing fetus. The measurement of your blood lead level (BLL) is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels are most often reported in units of milligrams (mg) or micrograms (µg) of lead (1 mg = 1000 µg) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometimes BLLs are expressed in the form of mg percent or µg percent. This is a shorthand notation for 100g, 100 ml, or dl. (References to BLL measurements in this standard are expressed in the form of µg/dl.)

b. BLL measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. BLL measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between BLLs and various diseases. As a result, your BLL is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

c. Once your blood lead level climbs above 40 µg/dl, your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular BLL in a given person will cause a particular effect. Studies have associated fatal encephalopathy with BLLs as low as 150 µg/dl. Other studies have shown other forms of diseases in some workers with BLLs well below 80 µg/dl. Your BLL is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated BLLs. The longer you have an elevated BLL, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage. The best way to prevent all forms of lead-related impairments and diseases, both short term and long term, is to maintain your BLL below 40 µg/dl. The provisions of the standard are designed with this end in mind.

d. Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You, as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing his or her actions.

4. Reporting signs and symptoms of health problems: You should immediately notify your supervisor if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead or your ability to have a
healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases, your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place. The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if your employer selected the initial physician.

IV. THE OSHA LEAD STANDARD FOR THE CONSTRUCTION INDUSTRY - 29 CFR PART 1926.62

A. Permissible Exposure Limit (PEL) - Paragraph (C)

The standard sets a permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air (50 \( \mu g/m^3 \)), averaged over an 8-hour workday which is referred to as a time-weighted average (TWA). This is the highest level of lead in air to which you may be permissibly exposed over an 8-hour workday. However, since this is an 8-hour average, short exposures above the PEL are permitted so long as for each 8-hour work day your average exposure does not exceed this level. This interim final standard, however, takes into account the fact that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this situation, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be 40 \( \mu g/m^3 \).

B. Exposure Assessment - Paragraph (D)

1. If lead is present in your workplace in any quantity, your employer is required to make an initial determination of whether any employee's exposure to lead exceeds the action level (30 \( \mu g/m^3 \) averaged over an 8-hour day). Employee exposure is that exposure which would occur if the employee were not using a respirator. This initial determination requires your employer to monitor workers' exposures unless he or she has objective data which can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. Where objective data is used in lieu of actual monitoring the employer must establish and maintain an accurate record, documenting its relevancy in assessing exposure levels for current job conditions. If such objective data is available, the employer need proceed no further on employee exposure assessment until such time that conditions have changed and the determination is no longer valid.

2. Objective date may be compiled from various sources, e.g., insurance companies and trade associations and information from suppliers or exposure data collected from similar operations. Objective data may also comprise previously-collected sampling data including area monitoring. If it cannot be determined through using objective data that worker exposure is less than the action level, your employer must conduct monitoring or must rely on relevant previous personal sampling, if available. Where monitoring is required for the initial determination, it may be limited to a representative number of employees who are reasonably expected to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past 12 months, he or she may use these results, provided they are applicable to the same employee tasks and
exposure conditions and meet the requirements for accuracy as specified in the standard. As with objective data, if such results are relied upon for the initial determination, your employer must establish and maintain a record as to the relevancy of such data to current job conditions.

3. If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination.

4. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level, your employer must set up an air monitoring program to determine the exposure level representative of each employee exposed to lead at your workplace. In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but he or she must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represent full shift exposure. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead. Sampling performed in the past 12 months may be used to determine exposures above the action level if such sampling was conducted during work activities essentially similar to present work conditions.

5. The standard lists certain tasks which may likely result in exposures to lead in excess of the PEL and, in some cases, exposures in excess of 50 times the PEL. If you are performing any of these tasks, your employer must provide you with appropriate respiratory protection, protective clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until such time that an exposure assessment is conducted which demonstrates that your exposure level is below the PEL.

6. If you are exposed to lead and air sampling is performed, your employer is required to notify you in writing within 5 working days of the air monitoring results which represent your exposure. If the results indicate that your exposure exceeds the PEL (without regard to your use of a respirator), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that has been taken or will be taken to reduce your exposure.

7. Your exposure must be rechecked by monitoring, at least every six months if your exposure is at or over the action level but below the PEL. Your employer may discontinue monitoring for you if 2 consecutive measurements, taken at least 7 days apart, are at or below the action level. Air monitoring must be repeated every 3 months if you are exposed over the PEL. Your employer must continue monitoring for you at this frequency until 2 consecutive measurements, taken at least 7 days apart, are below the PEL but above the action level, at which time your employer must repeat monitoring of your exposure every six months and may discontinue monitoring only after your exposure drops to or below the action level. However, whenever there is a change of equipment, process, control, or personnel or a new type of job is added at your
workplace which may result in new or additional exposure to lead, your employer must perform additional monitoring.

C. Methods of Compliance - Paragraph (E)

1. Your employer is required to assure that no employee is exposed to lead in excess of the PEL as an 8-hour TWA. The interim final standard for lead in construction requires employers to institute engineering and work practice controls including administrative controls to the extent feasible to reduce employee exposure to lead. Where such controls are feasible but not adequate to reduce exposures below the PEL they must be used nonetheless to reduce exposures to the lowest level that can be accomplished by these means and then supplemented with appropriate respiratory protection.

2. Your employer is required to develop and implement a written compliance program prior to the commencement of any job where employee exposures may reach the PEL as an 8-hour TWA. The interim final standard identifies the various elements that must be included in the plan. For example, employers are required to include a description of operations in which lead is emitted, detailing other relevant information about the operation such as the type of equipment used, the type of material involved, employee job responsibilities, operating procedures and maintenance practices. In addition, your employer's compliance plan must specify the means that will be used to achieve compliance and, where engineering controls are required, include any engineering plans or studies that have been used to select the control methods. If administrative controls involving job rotation are used to reduce employee exposure to lead, the job rotation schedule must be included in the compliance plan. The plan must also detail the type of protective clothing and equipment, including respirators, housekeeping and hygiene practices that will be used to protect you from the adverse effects of exposure to lead.

3. The written compliance program must be made available, upon request, to affected employees and their designated representatives, the Assistant Secretary and the Director.

4. Finally, the plan must be reviewed and updated at least every 6 months to assure it reflects the current status in exposure control.

D. Respiratory Protection - Paragraph (F)

1. Your employer is required to provide and assure your use of respirators when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level is not above the PEL. You might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to minimize adverse reproductive effects. While respirators are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection.
2. Your employer is required to select respirators from the types listed in Table I of the Respiratory Protection section of the standard. Any respirator chosen must be approved by the Mine Safety and Health Administration (MSHA) or the National Institute for Occupational Safety and Health (NIOSH). This respirator selection table will enable your employer to choose a type of respirator which will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your workplace. For example, a powered air purifying respirator (PAPR) is much more protective than a typical negative pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time. The standard provides that you can obtain a PAPR upon request.

3. Your employer must also start a Respiratory Protection Program. This program must include written procedures for the proper selection, use, cleaning, storage, and maintenance of respirators.

4. Your employer must assure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical. Obtaining a proper fit on each employee may require your employer to make available two or three different mask types. In order to assure that your respirator fits properly and that facepiece leakage is minimized, your employer must give you either a qualitative fit test or a quantitative fit test (if you use a negative pressure respirator) in accordance with Appendix D of the Standard (Respirator Fit Testing). Any respirator which has a filter, cartridge or canister which cleans the work room air before you breathe it and which requires the force of your inhalation to draw air through the filtering element is a negative pressure respirator. A positive pressure respirator supplies air to you directly. A quantitative fit test uses a sophisticated machine to measure the amount, if any, of test material that leaks into the facepiece of your respirator.

5. You must also receive from your employer proper training in the use of respirators. Your employer is required to teach you how to wear a respirator, to know why it is needed, and to understand its limitations.

6. Your employer must test the effectiveness of your negative pressure respirator initially and at least every six months thereafter with a "qualitative fit test." In this test, the fit of the facepiece is checked by seeing if you can smell a substance placed outside the respirator. If you can, there is appreciable leakage where the facepiece meets your face.

7. The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the filter elements whenever an increase in breathing resistance is detected. You also must be permitted to periodically leave your work area to wash your face and respirator facepiece whenever necessary to prevent skin irritation. If you ever have difficulty in breathing during a fit test or while using a respirator, your
employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

E. Protective Work Clothing and Equipment - Paragraph (G)

1. If you are exposed to lead above the PEL as an 8-hour TWA, without regard to your use of a respirator, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200 µg/m³. Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. In addition, your employer is responsible for providing repairs and replacement as necessary, and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment.

2. The interim final standard requires that your employer assure that you follow good work practices when you are working in areas where your exposure to lead may exceed the PEL. With respect to protective clothing and equipment, where appropriate, the following procedures should be observed prior to beginning work:

   a. Change into work clothing and shoe covers in the clean section of the designated changing areas;
   b. Use work garments of appropriate protective gear, including respirators before entering the work area; and
   c. Store any clothing not worn under protective clothing in the designated changing area.

3. Workers should follow these procedures upon leaving the work area:

   a. HEPA vacuum heavily contaminated protective work clothing while it is still being worn. At no time may lead be removed from protective clothing by any means which result in uncontrolled dispersal of lead into the air;
   b. Remove shoe covers and leave them in the work area;
   c. Remove protective clothing and gear in the dirty area of the designated changing area. Remove protective coveralls by carefully rolling down the garment to reduce exposure to dust.
   d. Remove respirators last; and
   e. Wash hands and face.

4. Workers should follow these procedures upon finishing work for the day (in addition to procedures described above):

   a. Where applicable, place disposal coveralls and shoe covers with the abatement waste;
b. Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room.
c. Clean protective gear, including respirators, according to standard procedures;
d. Wash hands and face again. If showers are available, take a shower and wash hair. If shower facilities are not available at the work site, shower immediately at home and wash hair.

F. Housekeeping - Paragraph (H)

Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is generally prohibited unless removal with compressed air is done in conjunction with ventilation systems designed to contain dispersal of the lead dust. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used equipped with a special filter called a high-efficiency particulate air (HEPA) filter and emptied in a manner which minimizes the reentry of lead into the workplace.

G. Hygiene Facilities and Practices - Paragraph (I)

1. The standard requires that hand washing facilities be provided where occupational exposure to lead occurs. In addition, change areas, showers (where feasible), and lunchrooms or eating areas are to be made available to workers exposed to lead above the PEL. Your employer must assure that except in these facilities, food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, where airborne exposures are above the PEL. Change rooms provided by your employer must be equipped with separate storage facilities for your protective clothing and equipment and street clothes to avoid cross-contamination. After showering, no required protective clothing or equipment worn during the shift may be worn home. It is important that contaminated clothing or equipment be removed in change areas and not be worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc.

2. Lunchrooms or eating areas may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth, or other cleaning method. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

3. All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes, or your possessions. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.
H. Medical surveillance - Paragraph (J)

1. The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have effectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers:
   a. who have high body burdens of lead acquired over past years,
   b. who have additional uncontrolled sources of non-occupational lead exposure,
   c. who exhibit unusual variations in lead absorption rates, or
   d. who have specific non-work related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia).

In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability - regardless of whether you are a man or woman.

2. All medical surveillance required by the interim final standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts -- periodic biological monitoring and medical examinations. Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring program. Full medical surveillance must be made available to all employees who are or may be exposed to lead in excess of the action level for more than 30 days a year and whose blood lead level exceeds 40 µg/dl. Initial medical surveillance consisting of blood sampling and analysis for lead and zinc protoporphyrin must be provided to all employees exposed at anytime (1 day) above the action level.

3. Biological monitoring under the standard must be provided at least every 2 months for the first 6 months and every 6 months thereafter until your blood lead level is below 40 µg/dl. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an adverse metabolic effect of lead on your body and is therefore an indicator of lead toxicity.

4. If your BLL exceeds 40 µg/dl the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive BLLs indicate a blood lead level below 40 µg/dl. Each time your BLL is determined to be over 40 µg/dl, your employer must notify you of this in writing within five working days of his or her receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your BLL exceeds 50 µg/dl. (See Discussion of Medical Removal Protection - Section I. below.) Anytime your BLL exceeds 50 µg/dl your employer must make available to you within two weeks of receipt of these test
results a second follow-up BLL test to confirm your BLL. If the two tests both exceed 50 µg/dl, and you are temporarily removed, then your employer must make successive BLL tests available to you on a monthly basis during the period of your removal.

5. Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level exceeds 40 µg/dl at any time during the preceding year and you are being exposed above the airborne action level of 30 µg/m³ for 30 or more days per year. The initial examination will provide information to establish a baseline to which subsequent data can be compared.

6. An initial medical examination to consist of blood sampling and analysis for lead and zinc protoporphyrin must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level at any time. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

7. Appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See Section I, below.)

8. The standard specifies the minimum content of pre-assignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Pre-assignment and annual medical examinations must include:

   a. a detailed work history and medical history;
   b. a thorough physical examination, including an evaluation of your pulmonary status if you will be required to use a respirator;
   c. a blood pressure measurement; and
   d. a series of laboratory tests designed to check your blood chemistry and your kidney function.

In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

9. The standard does not require that you participate in any of the medical procedures, tests, etc. which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which will give you a chance to have a physician of your choice directly participate in the medical surveillance program. If you are dissatisfied with an examination by a physician
chosen by your employer, you can select a second physician to conduct an independent analysis. The two doctors would attempt to resolve any differences of opinion, and select a third physician to resolve any firm dispute. Generally your employer will choose the physician who conducts medical surveillance under the lead standard - unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.

10. The standard requires your employer to provide certain information to a physician to aid in his or her examination of you. This information includes:
   a. the standard and its appendices,
   b. a description of your duties as they relate to occupational lead exposure,
   c. your exposure level or anticipated exposure level,
   d. a description of any personal protective equipment you wear,
   e. prior blood lead level results, and
   f. prior written medical opinions concerning you that the employer has.

11. After a medical examination or consultation the physician must prepare a written report which must contain:
   a. the physician's opinion as to whether you have any medical condition which places you at increased risk of material impairment to health from exposure to lead,
   b. any recommended special protective measures to be provided to you,
   c. any blood lead level determinations, and
   d. any recommended limitation on your use of respirators. This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

12. The medical surveillance program of the interim lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true, these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including worker compensation laws, that disallow a worker who learns of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that OSHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for OSHA to make you aware of this.
13. The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand, it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium EDTA (Ca Na₂ EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

14. The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to predesignated concentrations believed to be "safe". It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

15. The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation involved giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

16. In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

I. Medical Removal Protection - Paragraph (K)

1. Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from his or her regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits. The purpose of this program is to cease further lead absorption and allow your body to
naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. For up to 18 months, or for as long as the job the employee was removed from lasts, protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires.

2. You may also be removed from exposure even if your blood lead level is below 50 µg/dl if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so.

3. The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

4. In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or he or she may be temporarily laid off if no other alternative is feasible.

5. In all of these situation, MRP benefits must be provided during the period of removal - i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings includes more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the doctor believes to be appropriate. If you do not participate in this follow up medical surveillance, you may lose your eligibility for MRP benefits.

6. When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.
7. If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

8. The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

J. Employee Information and Training - Paragraph (L)

1. Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead compounds such as lead arsenate or lead azide. The program must train these employees regarding the specific hazards associated with their work environment, protective measures which can be taken, including the contents of any compliance plan in effect, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. All employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

2. This training program must also be provided at least annually thereafter unless further exposure above the action level will not occur.

K. Signs - Paragraph (M)

1. The standard requires that the following warning sign be posted in work areas where the exposure to lead exceeds the PEL:

   WARNING
   LEAD WORK AREA
   POISON
   NO SMOKING OR EATING

2. These signs are to be posted and maintained in a manner which assures that the legend is readily visible.

L. Recordkeeping - Paragraph (N)

1. Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytical techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Such records are to be retained for at least 30 years. Your employer is also required to keep all records of biological
monitoring and medical examination results. These records must include the names of the employees, the physician's written opinion, and a copy of the results of the examination. Medical records must be preserved and maintained for the duration of employment plus 30 years. However, if the employee's duration of employment is less than one year, the employer need not retain that employee's medical records beyond the period of employment if they are provided to the employee upon termination of employment.

2. Recordkeeping is also required if you are temporarily removed from your job under the medical removal protection program. This record must include your name and social security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

3. The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than BLL's must also be provided upon request to you, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

M. Observation of Monitoring - Paragraph (O)

When air monitoring for lead is performed at your workplace as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

N. Effective Date - Paragraph (P)

The standard's effective data is June 3, 1993. Employer obligations under the standard begin as of that date with full implementation of engineering controls as soon as possible but no later than within 4 months, and all other provisions completed as soon as possible, but no later than within 2 months from the effective date.

V. WORK PROCEDURES

A. General

1. While all potential exposures to lead aerosols must be controlled, different techniques may be used depending on the specific activity or situation. The preferred method of exposure control is engineering (e.g., local
ventilation). If engineering controls are not feasible or adequate to reduce exposures to acceptable levels, then special work practices and personal protective equipment must be used.

2. Activities can be generally considered to fall into one of three categories:

   a. Category I: Small scale short duration activities including minor repair work such as patching, drilling or demolition work that can be completed in less than one hour. Welding, heat gun use or other thermal processes, and abrasive blasting cannot be considered Category I activities, no matter the size or duration of the project.

   b. Category II: Activities lasting one hour or longer, that have a potential for exposure at the AL but below the PEL, or activities being initially evaluated for exposure levels. Includes most construction work involving sanding, scraping, cutting, grinding, welding, demolition and applying of lead containing paint or coatings.

   c. Category III: Activities in housing units and child occupied facilities, abrasive blasting, and activities that have been shown to potentially exceed the PEL.

3. Controls, work practices and PPE to be used or omitted on any activities impacting LCM must be in accordance with this program or have prior approval of OSEH.

4. Air Monitoring

   a. In all potential lead exposure situations, air monitoring must be done both initially and at regular intervals, depending on the results of previous or initial air monitoring, or the amount of time since the activity was monitoring in the past. All air monitoring for lead exposure will be handled through OSEH.

   b. If a negative exposure determination is made for a specific activity, then air monitoring may cease until there is a change in control methods, equipment, work practices or personnel, at which point air monitoring will resume.

B. Category I

1. Preparation

Prepare the work area in a manner that will protect building occupants and property from contact with LCM. When surface contamination of floors, furniture, and other items is suspected, surface contamination shall be removed by HEPA vacuuming or wet wiping with a soap solution.

   a. Building Interiors: Cover all non-working horizontal surfaces within 10 feet of the work area with plastic sheeting. As necessary to control work area dust, discontinue building ventilation within the work area and seal off the ventilation supply and return or exhaust diffusers, grilles or openings.

   b. Building Exteriors: Cover the grounds and vegetation with plastic sheeting within 10 feet of the work area and with the free ends secured in position with stakes, tie-down lines or weights. Cover
sufficient ground area to capture wind-blown chips, dust and particles.

c. Restrict access to trained and essential personnel only.

2. Personal Protective Equipment

a. Each employee in the work area shall wear at a minimum a half-face negative pressure respirator equipped with HEPA filters. The need for higher levels of respiratory protection will be dictated by monitoring results, or the type of work activity prior to obtaining air monitoring results. Each employee who wears a respirator shall participate in the Respiratory Protection Program and have been issued their respirator through OSEH where appropriate fit testing and training is conducted.

b. Hand, eye and face protection, and protective coveralls will be used as necessary to protect workers from contamination, irritation or other injuries.

c. Employees will wash hands and face upon leaving the work area. Eating and drinking in the work area is prohibited.

3. Work Methods Related to Specific Operations

a. Surface Prep for Removal or Repairing Painted Surfaces:

i. Remove paint from surfaces by hand scraping and sanding.

ii. Wet removal methods using misted water should always be used in conjunction with hand scraping and sanding. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground or adjacent surfaces. Sanding of painted surfaces should be minimized as much as possible.

iii. Dry removal methods such as power sanding or other methods relying on high velocity mechanical abrasion that create fine air borne dusts, fumes or particulates are prohibited unless done in conjunction with a dedicated local exhaust ventilation system or vacuum system with HEPA filtration. OSEH will be consulted when designing control methods.

iv. Power washing of exterior surfaces is prohibited, unless approved by OSEH.

v. Chemical stripping methods will not be used unless first approved by OSEH due to the additional hazards associated with chemical strippers.

b. Demolition:

i. Perform demolition operations in a manner that does not contaminate the work area or generate airborne dust and particles unnecessarily.

ii. Remove and stockpile materials in the largest sections possible. Do not separate lead sheet materials that are adhesively laminated to gypsum substrates.
4. Clean Up
   a. After removal of waste, clean work tools/equipment, and clean all potentially contaminated surfaces within the work area. Include, as necessary, the following surfaces:
      i. siding
      ii. floors
      iii. walls
      iv. window sills
      v. trim
      vi. ledges and projections
   b. Use a solution of soap or detergent to wash surfaces or use a HEPA filter vacuum or other method that minimizes the likelihood of lead becoming airborne.
   c. Wash hands and face with soap and water immediately after completing work and before taking breaks. Clean all respirators, inside and out, with a mild soap and water solution daily and at the end of the project.

5. Air Monitoring
   a. Representative air monitoring must be conducted initially for all Category I activities, and subsequent to initial monitoring at least annually. OSEH will coordinate this monitoring upon notification of the planned work.
   b. At any time worker exposure levels are found to above the AL, the activity being monitored will stop and be reevaluated for potential problems. This activity will shift to Category II and regular air monitoring will continue at least twice per week until two consecutive air monitoring results within a 7-day period for that activity are shown to be below the AL.
   c. At any time worker exposure levels are found to above the PEL, the activity being monitored will stop and be reevaluated for potential problems. This activity will shift to Category III and regular air monitoring will continue at least twice per week until two consecutive air monitoring results within a 7 day period for that activity are shown to be below the AL.

6. Staffing
   All workers must be trained for lead compliance as outlined in this program. At least one worker must be a competent person. If only one employee is conducting work activities, then this worker must be a competent person.

   C. Category II

   1. Preparation
      Prepare the work area in a manner that will protect building occupants and property from contact with LCM. When surface contamination of floors, furniture, and other items is suspected, surface contamination shall be removed by HEPA vacuuming or wet wiping with a soap solution.
a. **Building Interiors**: Construct critical barriers and seal off openings and penetrations into the work area, including doorways and windows. Use polyethylene plastic sheeting on wood studs if necessary; lap and tape joints of plastic sheeting to prevent LCM dust, particles, or fumes from leaving the enclosed area. As necessary to control work area dust, discontinue building ventilation within the work area and seal off the ventilation supply and return or exhaust diffusers, grilles or openings.

b. **Building Exteriors**: Erect barricades and install warning tape or signs as necessary to prevent inadvertent exposure of passersby to LCM in all forms including dust, particles and fumes. Completely cover the grounds and vegetation with 8-mil thick polyethylene sheets with joints between sheets lapped and taped; with one edge taped to adjacent building surfaces below area of work; and with free ends secured in position with stakes, tie-down lines or weights. Cover sufficient ground area to capture wind-blown chips, dust and particles.

c. Restrict access to trained and essential personnel only.

2. **Personal Protective Equipment**

a. Unless work involves initial monitoring of welding, heat gun use or other thermal processes, or abrasive blasting activities, each employee in the work area shall wear at a minimum a half-face negative pressure respirator equipped with HEPA filters. If work involves initial monitoring of welding, heat gun use or other thermal processes, or abrasive blasting activities, each worker will wear at a minimum a tight fitting full-face air filtering respirator with HEPA filter cartridges. The need for higher or lower levels of respiratory protection will be dictated by monitoring results. Each employee who wears a respirator shall participate in the Respiratory Protection Program and have been issued their respirator through OSEH where appropriate fit testing and training is conducted.

b. Disposable protective coveralls including head covers, gloves, and foot covers shall be worn. Protective clothing will be removed inside the work area and when the work area is exited. Disposable coveralls will be replaced at least daily or when the garment becomes to worn to provide protection.

c. Hand, eye and face protection will be used as necessary to protect workers from irritation or other injuries.

d. Employees will wash hands and face upon leaving the work area. Eating and drinking in the work area is prohibited.

3. **Work Methods Related to Specific Operations**

a. **Surface Prep for Removal or Repairing Painted Surfaces**:

i. Remove paint from surfaces by hand scraping and sanding.

ii. Wet removal methods using misted water should always be used in conjunction with hand scraping and sanding. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground or
adjacent surfaces. Sanding of painted surfaces should be minimized as much as possible.

iii. Dry removal methods such as power sanding, heat gun removal, welding, or other methods relying on high velocity mechanical abrasion that create fine airborne dusts, fumes or particulates are prohibited unless done in conjunction with a dedicated local exhaust ventilation system or vacuum system with HEPA filtration. OSEH will be consulted when designing control methods. Abrasive blasting removal is prohibited.

iv. Power washing of exterior surfaces is prohibited, unless approved by OSEH.

v. Chemical stripping methods will not be used unless first approved by OSEH due to the additional hazards associated with chemical strippers.

b. Demolition:

i. Perform demolition operations in a manner that does not contaminate the work area and generate airborne dust and particles unnecessarily.

ii. Remove and stockpile materials in the largest sections possible. Do not separate lead sheet materials that are adhesively laminated to gypsum substrates.

iii. Welding, Burning and Hot Work: When performing these operations in building interiors, adequate local exhaust ventilation to draw lead fumes away from the employee's breathing zone must be utilized. OSEH will be consulted when designing control methods.

c. Welding, Heat Gun Use or Other Thermal Processes, Abrasive Blasting, Melting, Forging and Machining:

i. These operations will only be done in conjunction with local exhaust ventilation to draw fumes away from the worker’s breathing zone, adequate respiratory protection, and control of air emissions to areas outside of the work area.

ii. Non-construction related activities must use engineering controls installed to keep exposures below the PEL, and the performance of the engineering controls must be checked quarterly.

4. Clean Up

a. After removal of waste, clean work tools/equipment, and clean all potentially contaminated surfaces within the work area. Include, as necessary, the following surfaces:

i. siding

ii. floors

iii. walls

iv. window sills

v. trim

vi. ledges and projections
b. Use a solution of soap or detergent to wash surfaces or use a HEPA filter vacuum or other method that minimizes the likelihood of lead becoming airborne.

c. Shower, or wash hands and face with soap and water immediately after completing work and before taking breaks. Clean all respirators, inside and out, with a mild soap and water solution daily and at the end of the project.

5. Air Monitoring

a. Representative air monitoring must be conducted initially for all Category II activities, and subsequent to initial monitoring at least once every six months. OSEH will coordinate this monitoring upon notification of the planned work.

b. At any time worker exposure levels are found to above the PEL, the activity being monitored will stop and be reevaluated for potential problems. This activity will shift to Category III and regular air monitoring will continue at least twice per week until two consecutive air monitoring results within a 7 day period for that activity are shown to be below the AL.

6. Staffing

All workers must be trained for lead compliance as outlined in this program. At least two workers will be onsite while work is in progress and at least one worker must be a competent person.

D. Category III

1. Preparation

Prepare the work area in a manner that will protect building occupants and property from contact with LCM. When surface contamination of floors, furniture, and other items is suspected, surface contamination shall be removed by HEPA vacuuming or wet wiping with a soap solution.

a. **Building Interiors:** Construct double layer full containment of floors, walls, ceilings and seal off openings and penetrations into the work area, including doorways and windows. Only the surfaces of materials to be effected by actual work should remain uncovered. Use polyethylene plastic sheeting on wood studs if necessary. Lap and tape joints of plastic sheeting to prevent LCM dust, particles or fumes from leaving the containment area. As necessary to control work area dust, discontinue building ventilation within the work area and seal off the ventilation supply and return or exhaust diffusers, grilles or openings. Install a HEPA filtered filtration unit exhausted to the outside of the building in order to keep the containment under continuous negative air pressure.

b. **Building Exteriors:** Completely cover the grounds and vegetation with 8-mil thick polyethylene sheets with joints between sheets lapped and taped; with one edge taped to adjacent building surfaces below area of work; and with free ends secured in position with stakes, tie-down lines or weights. Cover sufficient ground
area to capture wind-blown chips, dust and particles. Erect barricades and install warning tape or signs as necessary to prevent inadvertent exposure of passersby to LCM in all forms including dust, particles and fumes.

c. Restrict access to trained and essential personnel only.
d. Erect warning signs around all areas of the containment and work area. Warming signs must say:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

2. Personal Protective Equipment

a. Unless work involves initial monitoring of welding, heat gun use or other thermal processes, or abrasive blasting activities, each employee in the work area shall wear at a minimum a half-face negative pressure respirator equipped with HEPA filters. If work involves initial monitoring of welding, heat gun use or other thermal processes, or abrasive blasting activities, each worker will wear at a minimum a tight fitting full face air filtering respirator with HEPA filter cartridges. The need for higher or lower levels of respiratory protection will be dictated by monitoring results. Each employee who wears a respirator shall participate in the Respiratory Protection Program and have been issued through OSEH where appropriate fit testing and training is conducted.

b. Disposable protective coveralls including head covers, gloves, and foot covers shall be worn. Protective clothing will be removed inside the work area and when the work area is exited. Disposable coveralls will be replaced at least daily or when the garment becomes to worn to provide protection.

c. Hand, eye and face protection will be used as necessary to protect workers from irritation or other injuries.

d. Employees will wash hands and face upon leaving the work area. Eating and drinking in the work area is prohibited.

3. Work Methods Related to Specific Operations

a. Surface Prep for Removal or Repairing Painted Surfaces:

i. Remove paint from surfaces by hand scraping and sanding.

ii. Wet removal methods using misted water should always be used in conjunction with hand scraping and sanding. Wetting methods should use water in amounts that will not result in water that can drip, spill or leak onto the ground or adjacent surfaces. Sanding of painted surfaces should be minimized as much as possible.

iii. Dry removal methods such as power sanding, heat gun removal, welding, or other methods relying on high velocity mechanical abrasion that create fine air borne dusts, fumes or particulates are prohibited unless done in conjunction with a dedicated local exhaust ventilation
system or vacuum system with HEPA filtration. OSEH will be consulted when designing control methods. Abrasive blasting removal is prohibited.

iv. Power washing of exterior surfaces is prohibited, unless approved by OSEH.

v. Chemical stripping methods will not be used unless first approved by OSEH due to the additional hazards associated with chemical strippers.

b. Demolition:

i. Perform demolition operations in a manner that does not contaminate the work area and generate airborne dust and particles unnecessarily.

ii. Remove and stockpile materials in the largest sections possible. Do not separate lead sheet materials that are adhesively laminated to gypsum substrates.

ii. Welding, Burning and Hot Work: When performing these operations in building interiors, adequate local exhaust ventilation to draw lead fumes away from the employee's breathing zone must be utilized. OSEH will be consulted when designing control methods.

c. Welding, Heat Gun Use or Other Thermal Processes, Abrasive Blasting, Melting, Forging and Machining:

i. These operations will only be done in conjunction with local exhaust ventilation to draw fumes away from the worker’s breathing zone, adequate respiratory protection, and control of air emissions to areas outside of the work area.

ii. Non-construction related activities must use engineering controls installed to keep exposures below the PEL, and the performance of the engineering controls must be checked quarterly.

4. Clean Up

a. After removal of waste, clean work tools/equipment, and clean all potentially contaminated surfaces within the work area. Include, as necessary, the following surfaces:

i. siding

ii. floors

iii. walls

iv. window sills

v. trim

vi. ledges and projections

b. Use a solution of soap or detergent to wash surfaces or use a HEPA filter vacuum or other method that minimizes the likelihood of lead becoming airborne.

c. Shower, or wash hands and face with soap and water immediately after completing work and before taking breaks. Clean all respirators, inside and out, with a mild soap and water solution daily and at the end of the project.
5. Air Monitoring
   a. Representative air monitoring must be conducted initially for all Category III activities. Regular air monitoring will continue at least twice per week until two consecutive air monitoring results within a 7 day period for that activity are shown to be below the AL. OSEH will coordinate this monitoring upon notification of the planned work.
   b. At any time worker exposure levels are found to above ten times (10x) the PEL, the activity being monitored will stop and be reevaluated for potential problems. Additional engineering controls, work practices and PPE will be instituted to control worker exposure.

6. Staffing
   a. All workers must be trained for lead compliance as outlined in this program. At least two workers will be onsite inside of the containment while work is in progress, at least one other worker will be onsite outside of the containment while work is in progress, and at least one worker must be a competent person. Communication between workers inside and outside of the containment will be maintained throughout the project.
   b. All workers on projects in residential areas or child care facilities will be trained in accordance with EPA regulations as outlined in the training section of this program.

E. Waste Handling

1. For work other than demolition, collect all LCM contaminated waste in leak tight containers. Roll plastic sheeting up in a manner that captures all waste inside sheeting and place in 4-6 mil thick plastic bags and seal in a manner that prevents spillage. If LCM is water saturated, place in doubled layer plastic bags. Plastic sheeting that has not been contaminated or that has been cleaned with a HEPA vacuum may be disposed as normal waste.

2. All disposable personal protective equipment worn during the work will be placed in plastic bags with other LCM waste.

3. Liquid LCM waste will be placed in pails or drums with a leak-proof covers.

4. Demolition waste cannot be discarded as regular waste until approved by OSEH. Additional testing of the waste may be required. Collect and cover demolition waste on site until the method of disposal has been determined. Contact OSEH for proper procedures.

5. Use preprinted labels on all containers of lead containing waste. Complete required information on the label: Name of contact person knowledgeable of the waste, building and room number where the waste was generated, and date (see Appendix B).
6. Secure the LCM waste in an appropriate location within the building it was generated. LCM must not leave the building until picked up by OSEH HazMat. Coordinate a secure storage location before work begins. Contact OSEH to arrange pickup of the waste.
APPENDIX A
## Requirements for Controlling Worker Exposures to Lead Aerosols during Construction Activities

<table>
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<tr>
<th>During Initial Assessment of Lead Related Tasks</th>
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<td></td>
<td>During Initial For Specific Lead Aerosol Exposure Levels*</td>
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<tr>
<td>Increased respiratory protection</td>
<td>Exposure assessment</td>
</tr>
<tr>
<td>(1926.62(d)(2) &amp; 1926.62(f))</td>
<td>and interim protection</td>
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<td>Housekeeping</td>
</tr>
<tr>
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<td>(1926.62(h))</td>
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<tr>
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</tr>
<tr>
<td>(1926.62(i)(2))</td>
<td>(1926.62(i)(5))</td>
</tr>
<tr>
<td>Handwashing facilities</td>
<td>Hazard communication training</td>
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<tr>
<td>(1926.62(i)(5))</td>
<td></td>
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<tr>
<td>Biological monitoring</td>
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<td>(1926.62(j)(1)(i))</td>
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<tr>
<td>Training</td>
<td></td>
</tr>
<tr>
<td>(1926.62(l)(1)(i), 1926.62(l)(2)(ii)(C &amp; 1926.21))</td>
<td></td>
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</table>

* Requirements are progressive and include those listed in columns for lower exposures to the left. Regulatory citations are all 29 CFR.
### Quick Reference Lead Compliance Activity Summary Table

<table>
<thead>
<tr>
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<th>Follow-up Phase</th>
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<td><strong>Category II</strong> (Below PEL, Not Hot Work or Abrasive Blasting)</td>
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<tr>
<td>Determine Building Age and Presence of Target Housing or Child-occupied Facilities (If present and built before 1978, then work must be done by state certified workers.)</td>
<td>Pre-cleaning</td>
<td>Pre-cleaning</td>
</tr>
<tr>
<td>Identify Suspect, Known and Assumed LCM</td>
<td>Remove Moveable Articles</td>
<td>Remove Moveable Articles</td>
</tr>
<tr>
<td>Evaluate Suspect LCM for Lead Content</td>
<td>Cover Horizontal Surfaces</td>
<td>Cover Horizontal Surfaces</td>
</tr>
<tr>
<td>Determine Level of Work (i.e., Category I, II or III)</td>
<td>Use PPE (respirator, head, body and foot covers, eye and face protection)</td>
<td>Erect Critical Barriers</td>
</tr>
<tr>
<td>Conduct Training and Medical Surveillance</td>
<td>Restrict Access to Work Area</td>
<td>Use and Replace PPE Daily</td>
</tr>
<tr>
<td>Coordinate Engineering Controls, Work Practices, PPE, Air Monitoring and Waste Handling and Storage</td>
<td>Use Wet Methods and HEPA Filtration</td>
<td>Restrict Access to Work Area</td>
</tr>
<tr>
<td></td>
<td>Hand Washing Facilities</td>
<td>Use Wet Methods and HEPA Filtration</td>
</tr>
<tr>
<td></td>
<td>Conduct Initial and Periodic Air Monitoring</td>
<td>Hand Washing and Personal Hygiene Facilities</td>
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<tr>
<td></td>
<td>Collect and Containerize Waste</td>
<td>Conduct Initial and Regular Air Monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collect and Containerize Waste</td>
</tr>
<tr>
<td>Follow-up Phase</td>
<td><strong>Inspect for Remaining Contamination</strong></td>
<td><strong>Conduct Follow-up Medical Surveillance, as necessary</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Conduct Follow-up Medical Surveillance, as necessary</strong></td>
<td><strong>Conduct Necessary Waste Testing</strong></td>
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<td><strong>Conduct Necessary Waste Testing</strong></td>
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<td><strong>Conduct Initial and Regular Air Monitoring</strong></td>
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<td><strong>Conduct Clearance Monitoring, As Necessary</strong></td>
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<td></td>
<td></td>
<td><strong>Collect and Containerize Waste</strong></td>
</tr>
</tbody>
</table>
# Lead Compliance Checklist

**Location:** ____________________________________________________  **Date:** _____________

## I Activity Category:
- I ___  II ___  III ___  Yes  No  NA

## II Preparation
- a. Hand Washing Facility Available (all categories)  
- b. Change Area Available (category III only)  
- c. Shower Available (category III only)  
- d. Lunch Area Available (category III only)

## III Work Area
- a. Pre-cleaning Done (all categories)  
- b. Movable Objects Removed (all categories)  
- c. Non-working Horizontal Surfaces Covered (all categories)  
- d. Critical Barriers Erected (categories II and III)  
- e. Ventilation Systems Covered (all categories)  
- f. Full Containment Erected (category III only)  
- g. Negative Pressure Established (category III only)  
- h. Access Restricted (all categories)  
- i. Barricades Erected (outdoors, categories II and III)  
- j. Warning Signs Posted (category III only)

## IV Exposure Controls
- a. Dust Control Used (e.g., water) (all categories)  
- b. HEPA Vacuums Used (all categories)  
- c. HEPA Filtered Local Exhaust Ventilation Used (hot work activities)  
- e. Respiratory Protection Used (all categories)  
  - List Type(s): ________________________________
- f. Disposable Coveralls Used (all categories)  
- g. Head and Foot Covers Used (all categories)  
- h. Other PPE Used (list): ________________________________

## V LCM Affected (all categories, be specific)
- Amt: __________  Desc: ________________________  Loc: _________________________
- Amt: __________  Desc: ________________________  Loc: _________________________
- Amt: __________  Desc: ________________________  Loc: _________________________
- Amt: __________  Desc: ________________________  Loc: _________________________

## VI Clean-up
- a. Waste Material Collected in Leak Tight Containers (all categories)  
- b. Barrier Materials Cleaned or Handled as LCM Waste (all categories)  
- c. PPE cleaned or disposed of as LCM Waste (all categories)  
- d. Waste Materials Stored Onsite for HazMat Pick-up (all categories)  
- e. Waste Containers Properly Labeled (all categories)

## VII Workers and Personal Monitoring (all categories)(Include additional workers on a separate page.)

<table>
<thead>
<tr>
<th>Name</th>
<th>Number</th>
<th>Air Monitoring Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
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<tr>
<td>b.</td>
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<tr>
<td>c.</td>
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<td>d.</td>
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<td>e.</td>
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<td>f.</td>
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<tr>
<td>g.</td>
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</tr>
</tbody>
</table>

Name: _________________________________  Signature: ______________________________

LeadChecklist2.doc  5/25/00
Instructions

Complete the heading of the form and select the appropriate category for the project or activities being documented.

Category Selection

Category I Projects/Activities: Small scale short duration activities including minor repair work such as patching, drilling or demolition work that can be completed in less than one hour. Welding, heat gun use or other thermal processes, milling, machining and forging activities on lead containing metals or materials, and abrasive blasting cannot be considered Category I activities, no matter the size or duration of the project.

Category II Projects/Activities: Activities lasting one hour or longer, that have a potential for exposure at the action level (AL) but below the permissible exposure limit (PEL), or activities being initially evaluated for exposure levels. Includes most construction work involving sanding, scraping, cutting, grinding, welding and demolition, milling, machining and forging activities on lead containing metals or materials, and applying of lead containing paint or coatings.

Category III Projects/Activities: Abrasive blasting or activities that have been shown to potentially exceed the PEL.

Once the activity has been categorized, proceed through the check list marking each item either “Yes”, “No” or not applicable (“NA”). Typically, each item on the checklist that is noted as applying to a certain category of work should be followed and checked “Yes”. If for some reason an applicable item is not checked “Yes”, then a reason or comment why that item was not followed should be included on the checklist. For example, item III.a. “Pre-cleaning” applies to all categories, but it probably wouldn’t be done if the project is a clean-up of flaking paint debris.

Be sure to include accurate descriptions of the LCM impacted by the work and the names of all of workers exposed to LCM during the project. If personal air monitoring is conducted for the project that day, enter the results on the line corresponding to the worker monitored.

The checklist should be started at the beginning of each workday or shift and be completed by the end of each workday or shift.

If a project includes more than one work site, or activities which fall into different categories, or use different control measures or workers, then a separate checklist should be completed for each work site or activity.

Once work is completed for the day, the checklist should be signed by the competent person for the project. Checklists should be kept on file until the project is completed, and then forwarded to OSEH.

If there are any questions about this checklist, the proper procedures or controls that should be used, or any other safety or health issues concerning lead containing materials, contact OSEH at 764-3141 or 647-1142.
APPENDIX B
APPENDIX C