

Lead Safety Manual

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*Contact and additional program information for the NAU Lead Safety Program are available on the NAU EH&S website. www.nau.edu/ehs, ocsafety@nau.edu, or nauehs@nau.edu

1.0 SCOPE AND APPLICABILITY

The purpose of Northern Arizona University's Lead Safety Program is to:

1. Prevent lead exposure of all students, employees, and their families
2. Provide employees who must work on lead abatement projects the tools to protect themselves and the inhabitants of the buildings, and the environment.
3. Prevent potential environmental contamination with lead from any University activities.
4. Make employees aware of the health risks associated with exposure to lead in the workplace.
5. Ensure that only EPA trained/certified employees are allowed to abate lead-containing materials, specifically lead- containing paint (Renovation and repair activity rules may differ based on specific circumstances).
6. Provide guidelines for non-EPA certified employees in recognizing and working safely with lead –containing materials.
7. Comply with lead regulations issued by OSHA/ADOSH, EPA/ADEQ, HUD, and other state and federal agencies.

This program is applicable to all employees of Northern Arizona University. "University employee" is defined as any individual who receives compensation from the University for work performed. It includes part-time and full time workers of both exempt and non-exempt status.

This program is applicable to all locations where elemental lead, inorganic lead compounds, or lead-containing paint is present.

With regard to OSHA, this program applies to, but is not limited to the disturbance of lead which involves manual demolition of structures, scraping, sanding, heat gun applications, power tool cleaning, cleanup, and spray painting of lead paint, using lead containing mortar, lead burning, rivet busting, abrasive blasting, welding, cutting, and torch burning. Described in general terms, it applies to removal or encapsulation, installation of lead materials, new construction or renovation, emergency cleanup, transportation, disposal, and storage of lead materials. It also covers incidental handling of lead bricks and similar solid lead materials.

With regard to EPA/HUD, this program applies to but is not limited to renovations in target housing or facilities occupied by children or pregnant women. Owners and occupants must receive information on lead based paint hazards before renovation begins. Individuals performing renovation must be properly trained and certified, and required work practices must be followed.

2.0 REGULATORY REFERENCES

OSHA 29 CFR 1910.1025, including Appendices A, B, C, D: Lead in General Industry – Regulates Permissible Exposure Limits (PELs), exposure monitoring, work practices, protective equipment, and medical monitoring requirement for any work involving exposure to lead.

OSHA 29 CFR 1926.62: Lead in Construction Industries - Regulates demolition, salvage, removal, encapsulation, installation, transportation, disposal, storage and containment of lead materials. The focus of this standard is to protect employee health during the disturbance of lead materials. Note that this standard applies to any detectable concentration of lead in a material.

EPA 40 CFR, Part 745: Lead-based paint poisoning prevention, including Sub-Parts D, E, F, and L – Identifies lead paint hazards and regulates renovation or sale of child occupied or target housing, and

training of individuals performing lead based paint activities.

Resource Conservation and Recovery Act (RCRA) - regulates the labeling, handling, storage and disposal of hazardous waste. Lead based paint (LBP) that has been removed from a building may be considered to be subject to this regulation depending on how quickly lead leaches from the paint.

Department of Housing and Urban Development (HUD) - Lead Safe Housing Rule is designed to protect children from exposure to lead dust in defined "target housing". The rule includes provisions for disclosure of known locations of lead based paint to tenants, distribution of informational pamphlets and abatement of lead based paint during conversions and major renovations. "target housing" excludes:

1. Housing built in or after 1 978
2. Housing exclusively for the elderly or people with a disability, unless a child under age 6 is expected to reside there
3. "Zero-bedroom" dwellings, including efficiency apartments, single room occupancy housing, dormitories or military barracks
4. Properties that have been found to be free of lead-based paint by certified lead-based paint inspectors

EPA's Lead Renovation, Repair and Painting Rule (RRP Rule) - requires that firms performing renovation, repair, and painting projects that disturb lead-based paint in homes, child care facilities and pre-schools built before 1978 have their firm certified by EPA (or an EPA authorized state), use certified renovators who are trained by EPA-approved training providers and follow lead-safe work practices.

3.0 PROGRAM ELEMENTS

Regulations addressing working with lead-containing materials are extensive and complex, and often confusing. Consequently, this program is broken into the following elements most commonly encountered for Northern Arizona University workers.

1. Handling lead bricks and other lead-containing metals, where no physical or chemical changes occur
2. Removal of lead-containing paint
3. Other operations where lead-containing items may be machined, heated, or otherwise handled in a manner where lead may be released into the air.
4. Total (100%) removal of lead, per EPA criteria and definition.
5. Working with lead- other

3.1 Handling lead bricks or other solid lead-containing items without physically or chemically changing the items

It is unlikely that handling of lead bricks or similar materials would lead to worker exposure above the OSHA Action Level (30 micrograms per cubic meter of air averaged over an eight- hour period). However, it is highly recommended that these materials be handled with appropriate PPE, specifically gloves and cover-up clothing. The PPE should be used for no other purpose than handling the lead, be stored in a closed container, and disposed of as lead waste when no longer used. Workers should be cognizant that any activities where lead materials are subject to abrasion, chemical treatment, etc. pose an increased risk of employee exposure and specific handling procedures should be developed. A sample protocol can be found in Appendix B.

3.2 Working with paint containing lead (removal, disposal)

The State of Arizona adheres to federal EPA requirements for certification and training of employees involved in removal of lead paint. Northern Arizona University must be (and is) a "Certified Firm" for its employees to participate in lead paint removal. There must also be a "Certified Renovator" who supervises all lead paint removal. This certification is obtained by participation in an approved training course, and certification is issued by the EPA accredited trainer. Work may be done by "trained workers"- workers who have been trained by a Certified Renovator, following EPA guidelines, to understand and properly handle lead-containing paint. Northern Arizona University has certified renovators and trained personnel; only these workers are permitted to remove lead-containing paint. Requirements for certification and training are found in Section 6.

All paint removal projects must be reviewed/inspected by Environmental Health and Safety. EHS will test the paint for lead content before any removal work begins. The testing will be conducted onsite, using an XRF (X-Ray Fluorescence) Spectrum Analyzer; this process does not disturb the integrity of the lead paint. If necessary, EHS may collect paint chips and submit them to an authorized laboratory for quantitative analysis. All analytical work must be completed before paint removal can begin. Inspections may be requested through the NAU EH&S website

Appendix B includes examples of acceptable lead-paint removing processes.

3.3 Working with welding, cutting and soldering of lead-containing materials

Lead vaporizes at 1100 ° F. and these vapors/fumes can be inhaled by unprotected workers. These processes can also generate minute particles of lead dust which can be inhaled. Improperly handled wastes from these processes pose a potential hazard to human health and the environment.

When there is reason to expect that the materials to be welded, cut, or otherwise disturbed contain lead, the materials should be tested by EH&S prior to beginning the work. If lead is present, use of appropriate respirators, and/or exhaust ventilation is required. Where exhaust ventilation is used to control employee exposures to acceptable levels, periodic exhaust performance assessments by EH&S are required.

Welding, cutting and soldering lead-containing materials must be done in well-ventilated areas. Areas where lead dust or debris may accumulate must be covered before the operations begin, and the covering material and waste disposed of in an appropriate covered container labeled "Lead Waste".

3.4 Working with lead -other

In locations such as Fine arts Studios, classrooms, and research labs, lead may be used in a variety of processes. Employees and students must be made aware of the hazards associated with each process, and the steps to protect themselves from exposure to the lead. For each unique process, written instructions must be developed and made readily available to all who utilize the given process.

If these processes have the potential to generate lead fumes or dusts, workers must wear appropriate respirators, gloves, protective clothing, and practice good hygiene (i.e., no food or drink in the workspace, through washing of hands and other exposed surfaces before leaving the workspace). Workers must collaborate with EH&S to identify the risks associated with the

various processes, and participate in a respiratory protection program where appropriate.

3.5 Total Removal of lead

When total removal of lead is required, EPA and OSHA dictate the use of very specific procedures (EPA 40 CFR Part 745, section L; OSHA 29 CFR 1910 and 1926). These processes are briefly outlined in Appendix B. It is not anticipated that total removal will be performed by Northern Arizona University employees. Should this become an issue, the Certified Renovator must work with EHS to implement EPA and OSHA compliant procedures.

3.6 Disposal of Lead-containing Batteries

Lead-Acid Batteries pose a potential threat to human health and the environment if improperly discarded. Intact batteries may be disposed of through the NAU Facility Services Universal Waste program. Non-intact lead-acid batteries are considered hazardous waste and require special treatment. EH&S will pick up and properly dispose of lead-acid batteries which are no longer intact. This service can be requested either online at the EH&S website or by phone (928-523-5903). Lead-Acid batteries must never be disposed of in regular trash.

4.0 ADMINISTRATION, COMPLIANCE, AND RESPONSIBILITIES

4.1 Administration and Responsibilities

4.1.1 The Lead Safety Program is administered by the NAU Office of Environmental Health and Safety. This includes writing and maintaining the program, risk assessments, measurement of or identification of lead-containing materials, approving all work processes, oversight or review of any medical monitoring, and ensuring proper training has been done. EH&S will provide consultation on any issues involving working with lead-containing materials.

4.1.2 Individual departments, both academic and administrative, are responsible for recognizing that lead is being handled in some form by personnel, and that the proper protocols, personal protective equipment, and training are provided and used. Department Heads and Directors hold the ultimate responsibility for the safety of department employees and adherence to University Safety Policies.

4.1.3 Supervisors are responsible for ensuring employees are adequately trained, familiar with the appropriate regulations and procedures, and perform their jobs in a safe and legal manner.

Supervisors, working with Department Heads, Directors, and others, are responsible for ensuring workers have appropriate equipment to safely do their jobs. This includes any unique safety equipment and personal protective equipment needed to safely perform tasks involving lead.

Supervisors are responsible for recognizing jobs with the potential for lead exposure, requesting pre-job analyses for the presence of lead, and if necessary providing PPE or modifying work practices (with assistance from EH&S) to address lead risks.

4.1.4 Employees are responsible for following approved procedures, utilizing PPE provided, and recognizing the hazards that lead-containing materials can pose. Employees are responsible for performing their jobs in a safe and legal manner, and communicating with their supervisor concerns about safety issues or their ability to safely perform assigned jobs.

4.2 Compliance

Northern Arizona University and all its employees are responsible for complying with all applicable Federal and State Regulations with regard to working with lead. Failure to do so may lead to disciplinary action at the discretion of supervisors, Directors, or Human Resources.

5.0 REQUIRED TRAINING AND RECORDKEEPING

Training requirements differ significantly for different elements of the Lead Safety Program, and are presented by element below.

5.1 Training

5.1.1 Handling lead bricks, other inert lead-containing objects: Workers whose jobs require they physically handle solid lead and lead-containing objects will be trained to understand the potential hazards of handling the lead, including carrying small amounts of lead dust home and exposing small children to lead. OSHA does not address training requirements for this element of the program, but EH&S strongly recommends that as a minimum, awareness training be provided and cover required PPE, proper decontamination, and disposal of PPE and cleaning materials. This training can be provided by EH&S or a knowledgeable supervisor.

5.1.2 Working with paint containing lead: Each team of employees involved in paint removal will be supervised by a Certified Renovator. The Certified Renovator will receive formal training and certification from an EPA accredited Lead training provider. The Certified Renovator is responsible for training everyone on his/her team in lead-safe work practices specific to each job.

5.1.3 Welding, cutting, soldering, i.e. activities that disturb the integrity of the lead: it is the responsibility of the employee's supervisor to ensure the employee has been trained to recognize materials that may contain lead, and the risks associated with physically disturbing those materials. OSHA does not address training requirements for this element of the program, but EH&S strongly recommends workers be trained to request lead testing, follow established procedures, wear appropriate PPE, and to perform appropriate cleanup following each job.

5.1.4 Working with lead -other: OSHA does not address training requirements for this program element, but EH&S strongly recommends that all workers should be made aware of the hazards associated with working with lead; this is the responsibility of the person in charge of the project.

5.1.5 Total Removal of lead: this activity must occur under the strict guidance of EPA. All workers participating in such activity must be Certified Lead Abatement workers. Should total lead removal become necessary, contact EH&S for guidance and to arrange the removal.

5.2 Record-Keeping

5.2.1 Handling lead bricks and other inert objects:
Training records

5.2.2 Removal of lead paint:
Certification and training records for the Certified Renovator
Documentation of pre-renovation training for all workers
Documentation of testing for presence of lead in paint or painted surfaces
Cleaning verification/oversight inspection records
Proof of notification of tenants or owner-occupants of the facility

Records associated with use of respirators, if appropriate

5.2.3 Welding, cutting, soldering or otherwise disturbing the integrity of lead- containing objects:

Training records

Records associated with use of respirators, if appropriate

Records of disposal of lead waste, if appropriate

5.2.4 Any medical surveillance records shall be kept for a period of 30 years.

APPENDIX A - DEFINITIONS

Action Level: Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period.

Blood Lead Level (BLL): A measure of the amount of blood present in an individual's blood, measured in micrograms per deciliter of blood

Certified Renovator: A worker who has taken the training and testing that permits him to remove lead-containing paint, and to supervise other trained workers at this task; Certified Renovator can provide training to other workers per EPA-approved curriculum

Lead: Metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition per OSHA are all other organic lead compounds.

Lead-based Paint: Paint containing at least 1.0 milligram of lead per square centimeter of surface area, (per EPA), or 0.5% lead by weight

Lead-Containing Material (LCM): Any material that has been confirmed through laboratory analysis to contain any detectable quantity of lead

Lead Exposure Assessment: Determination of employee exposure to lead by sampling/monitoring the employee's regular exposure to lead, typically in an eight-hour work day.

Lead Pamphlet: The lead hazard information pamphlet given to home-owners and tenants prior to beginning removal of lead paint

Permissible Exposure Limit: concentrations less than fifty micrograms per cubic meter of air, averaged over an 8-hour period.

Prohibited Practices: work practices prohibited during renovation:

- open-flame burning or torching of paint;
- dry sanding, grinding, planing by machine unless machine is EPA-approved
- operating a heat gun above 1100°F on lead paint

Renovation: Modification of a structure that disturbs lead paint

APPENDIX B - SPECIFIC PROCEDURES

This section can be used to add specific detailed procedures for specific tasks; those provided below

are samples only.

Appendix B1: Sample Protocol for Handling Lead Bricks, Pellets, or other Solid Lead Materials

Note: the most significant hazard associated with handling solid lead materials is the possibility of accumulating lead dust on skin or clothing, and taking it home, where small children or pregnant women can become exposed to the lead dust.

1. Before handling lead materials, workers should analyze the work to be done, and plan it in such a way as to minimize contact with the lead.
2. Workers should don gloves and appropriate protective clothing prior to working with lead.
3. Once the lead work is completed. Workers should carefully remove personal protective equipment and store it in a closed container; the container should be clearly labeled that it may contain lead dust.
4. When the need for the PPE no longer exists, i.e., no more lead work is anticipated in the near future, PPE should be disposed of as hazardous material containing lead waste.

Appendix B2: Sample protocol for Working with Paint Containing Lead

Note: Refer to EPA Document 740-R-09-002, Lead Safety for Renovation, Repair, and Painting for more detailed procedures.

1. The Certified Renovator responsible for the project will contact the EH&S department to determine the presence of absence of lead. If lead is determined to be present at/above threshold amounts, and the building is child occupied, the work must be carried out per EPA protocols. If lead is present in any quantity and/or the building is not child occupied, the work must be carried out per OSHA worker protection protocols.
2. If the work to be done is in or around a home, residents must be notified that the work will be done by presenting the owner or residents with EPA Pamphlet "Renovate Right". Owners/residents must acknowledge (preferably in writing) that the pamphlet has been received before any lead-containing paint can be removed.
3. All work must be performed under the supervision of the Certified Renovator.
4. All workers must be trained and wear appropriate PPE, including full-face respirators and total body covering.
5. Prior to beginning removal of paint containing lead, all interior or exterior surfaces must be covered with plastic sheeting with all seams and edges sealed.
6. All duct work opening into the area must be sealed with taped-down plastic sheeting.
7. All windows and door must be closed and covered with plastic sheeting
8. Acceptable methods of removing lead-based paint are limited to:
 - a. Wet-scraping or sanding
 - b. High-speed sanding or grinding ONLY with EPA-approved equipment and HEPA filtration of any dust.
9. NON-APPROVED removal methods include:
 - a. Open-flame burning or torching of paint
 - b. Use of high-speed sanding, grinding, power planing, needle gun, abrasive blasting or sandblasting, unless using EPA-approved equipment and protocols
 - c. Operating a heat gun at temperatures of 1100°F or greater
10. All wastes must be collected at the end of each work day, and contained to prevent release of

dust and debris. Such wastes must be stored in a manner and location that prevents access to and the release of dust or debris.

11. After the project is completed, the area must be thoroughly cleaned until no dust, debris, or residue remains
 - a. All paint chips and debris must be collected and sealed in a heavy-duty bag.
 - b. All protective sheeting must be removed and disposed of as lead contaminated waste
 - c. All objects that have been covered by plastic sheeting must be thoroughly cleaned.
 - d. All surfaces, including furniture must be HEPA-vacuumed, then wiped with a damp cloth or mop.
12. The areas must be tested to ensure no lead remains; contact EH&S for this; cleanliness should be verified in writing.

Appendix B3: Sample protocol; for working with welding, cutting or brazing of lead-containing materials

Metal plumbing piping and fittings may contain lead. When heated above 1100°F, lead is released as fumes, and can be inhaled by the worker. Special precautions should be taken when welding, cutting or brazing is required.

1. Prior to beginning work, contact EH&S to perform testing to determine whether lead is present.
2. If lead is found to be present, all cutting, brazing, and welding activities must be performed by properly trained workers.
3. If lead is present, workers will be required to wear full-face respirators and full-body covering.
4. When the job is completed, all waste will be bagged and treated as lead-containing waste. All disposable PPE will also be bagged and disposed of accordingly. Respirators should be thoroughly cleaned.

Appendix B4: Sample Guidelines for Working with Lead -Other

Workers In locations such as art studios, trade shops, classrooms, and research labs may work with a number of materials potentially containing lead. These include certain oil-based paints, lead wire or tape, lead sheeting, and metal alloys used in jewelry making or other activities. Often the worker is not sufficiently aware of the risks of lead poisoning and does not take proper precautions. Some precautions area listed below.

1. If working with lead wire, tape, or sheeting, non-porous gloves (such as nitrile) should be worn, and disposed of at the end of the work period.
2. If working with oil-based paints containing lead, use of non-porous gloves is recommended.
3. If any welding, cutting, or brazing is to be done, these operations should take place in a properly functioning fume hood.
4. Thorough and frequent hand-washing is recommended.

Appendix B5: Information for Working on Projects where complete removal of all lead is required.

On occasion, total removal of lead at a renovation site is required. This is most common on projects funded by HUD (Housing and Urban Development). These are not likely to occur at Northern Arizona University. However, should there be a need for total removal, the regulations and protocols are

extremely rigid and beyond the present training and abilities of NAU workers. The person in charge of such a project should contact EH&S for further guidance and to arrange for professional lead abatement.

APPENDIX C - FORMS AND LINKS TO FORMS, if applicable

Appendix C1: EPA Renovate Right: Important Lead Hazard Information for Families, Child Care Providers and Schools: <http://www.epsc.gov/PageFiles/121915/renovateright.pdf>

APPENDIX D: ADDITIONAL REFERENCES, if applicable

OSHA Lead in Construction:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10641

OSHA Lead in General Industry:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10030

EPA Lead Based Paint Poisoning Prevention Act: <http://www.gpo.gov/fdsys/pkg/CFR-2004-title40-vol29/xml/CFR-2004-title40-vol29-part745.xml>

HUD Lead Safe Housing Rule: <http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=e1741143a75841f15fcfd930d325ac2b&rgn=div5&view=text&node=24:1.1.1.1.24&idno=24>

EPA Lead Renovation Repair and Painting (RRP) Rule: <http://www2.epa.gov/lead/lead-renovation-repair-and-painting-program-rules>

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