SUBJECT AREA CONTENT

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Management System: Worker Safety and Health

Subject Area: Lead

VIEW/PRINT ALL (No Exhibits and Forms)

Effective Date: **Jun 10, 2016** (Rev 8.0) Periodic Review Due: **Jun 10, 2021**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak	Management System Steward: Gail Mattson

Introduction

Lead is an abundant element valued for its malleability, formability, and density. Its high radiation absorption characteristic has led to its use in experimental nuclear reactors and accelerators, primarily as a shielding material. Lead is used in construction and building trades in paint for its whitening and chalking properties, in solder for its low melting point and ease in bonding to copper, and in flashing for its malleability and ease of soldering. Lead is found in surface materials (lead in paint) in many buildings at BNL. There are some uses of lead-containing compounds in laboratory scale experiments.

Lead is a toxic substance that, if not handled properly, can create adverse health effects. The inhalation or ingestion of lead dust or particles can cause permanent health effects in children and adults. The OSHA, HUD, and EPA have established regulations to require a lead exposure prevention program for certain work conditions. The goal of these requirements is to reduce worker levels of exposure to lead, establish medical surveillance requirements to ensure early detection and treatment of disease, and minimize releases to the environment. This subject area describes BNL measures to enable compliance with these regulations.

This subject area also describes restrictions, defines permitted operations, and documents requirements on the Work Planning and Control for Experiments and Operations Subject Area.

When controlling workplace stressors, the process for determining feasible and effective controls is to be based on the following hierarchy of controls:

- Elimination
- Substitution
- Engineering controls
- Administrative controls
- Personal protective equipment.

The best controls are those that eliminate the hazard, followed by those that control the source or shield the worker from the source. Next in the hierarchy is work planning that limits workers exposure to the source. The least desirable approach is controlling exposure at the worker's location, especially the use of protective equipment worn by the worker.

Contents

- Collect waste solder and arrange for its removal.
- Conduct medical surveillance.
- Dispose of waste.

4. Lead Shielding and Ballast

- Evaluate lead shielding or ballast handling.
- Determine worker-exposure monitoring requirements; approve work practices and worker-protection measures.
- Determine/characterize radiation contamination.
- Determine waste stream.
- Ensure training is complete.
- Workers use PPE as required.
- Conduct operations.
- Clean surfaces.
- Conduct medical surveillance.

5. Lead in Firearms Use

Firing of Weapons in Qualification or Practice

- Ensure training is complete.
- Conduct occupational exposure monitoring.
- Minimize exposure.
- Complete forms.
- Conduct medical surveillance.

Berm Sifting at the Firing Range

- Evaluate operation.
- Conduct occupational exposure monitoring.
- Ensure training is complete.
- Workers use PPE as required.
- Minimize exposure.
- Conduct medical surveillance.
- Dispose of waste.

6. Lead Machining and Fabrication

- Evaluate lead machining or fabrication operations.
- Determine/characterize radiation contamination.
- Determine worker-exposure monitoring requirements; approve work practices and worker-protection measures.
- Determine waste stream.
- Ensure training is complete.
- Workers use PPE as required.
- Conduct operations.
- Establish schedule for clean-up.
- Conduct medical surveillance.

	• Dispose of waste.
7. Lead in Laboratory-scale Use	• Follow the Chemical Safety Subject Area. • Workers use PPE as required.
8. Lead in Drinking Water	• Arrange for sampling. • Run water for 5 minutes or until cold.
9. Melting Lead	• Evaluate lead-melting operations and areas. • Determine worker-exposure monitoring requirements; approve work practices and worker-protection measures. • Ensure training is complete. • Workers use PPE as required. • Melt away from breathing zone. • Establish schedule for clean-up. • Collect waste and arrange for its removal. • Conduct medical surveillance. • Dispose of waste.

Definitions

Exhibits

Contaminated PPE Label
Lead Sign
Recycling & Disposal of Lead
Reproductive Hazards of Lead

Forms

Application for the Use of BNL Firearms Range for Non-DOE Purposes
Outside Agency User Statement

Training Requirements and Reporting Obligations

This subject area contains the following training requirements (see the BNL Training and Qualifications website):

- Lead in the Workplace (TQ-LEAD1).

This subject area does not contain reporting obligations.

External/Internal Requirements

Requirement Number	Requirement Title
10 CFR 851	Worker Safety and Health Program
20 CFR Parts 1 and 30 (EEOICPA)	Interim Final Rule Implementing the Energy Employees Occupational Illness Compensation Program Act (EEOICPA)
29 CFR 1910	Labor/Occupational Safety and Health Standards
29 CFR 1926	Labor/Safety and Health Regulations for Construction
BSA Contract No. DE-SC0012704 - Clause C.4	Statement Of Work

References

29 CFR 1910.1025, Toxic and Hazardous Substances, Lead; Appendix A

29 CFR 1910.1450, Laboratory Hygiene Plan

29 CFR 1926.62, Occupational Health and Environmental Controls, Lead

BNL Training and Qualifications website

BNL Water Quality Consumer Confidence Report

Chemical Safety Subject Area

DHHS NIOSH Publication No. 96-132, *The Effects of Workplace Hazards on Male Reproductive Health*

Discharge Monitoring and Water Treatment Plant Reports, Environmental Protection Division website

EPA Technology Transfer Network Lead Compounds: *Hazard Summary* (Created in April 1992; revised in September 2011)

Facility Hazard Analysis and Risk Assessment Subject Area

Hazardous Waste Management Subject Area

Job Assessment (JAF) & Additional Medical Surveillance Form (AMS), Human Resources Directorate website

Lead CAS #7439-92-1 August 2007 CDC Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine ToxFAQs™

Mixed Waste Management Subject Area

National Environmental Policy Act (NEPA) and Cultural Resources Evaluations Subject Area

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

Site Environmental Report, Environmental Protection Division website

Work Planning and Control for Experiments and Operations Subject Area

Standards of Performance

All staff and guests shall comply with applicable Laboratory policies, standards, and procedures, unless a formal variance is obtained.

All staff and users shall identify, evaluate, and control hazards in order to ensure that work is conducted safely and in a manner that protects the environment and the public.

All staff and users shall ensure that they are trained and qualified to carry out their assigned responsibilities, and shall inform their supervisor if they are assigned to perform work for which they are not properly trained or qualified.

PROCEDURE: LEAD IN PAINTED SURFACES (CONSTRUCTION AND BUILDING MAINTENANCE)

Management System: Worker Safety and Health		
Subject Area: Lead		
1. Lead in Painted Surfaces (Construction and Building Maintenance)		
Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to BNL staff and non-BNL staff who remove or disturb lead in painted surfaces.

Required Procedure

Contact your Supervisor, Safety & Health Representative, Facility Support Representative, Environmental Safety and Health Coordinator, Work Control Managers/Coordinator, or the Lead Subject Matter Expert for assistance in obtaining any service below.

Step 1	The Work Planner or staff contacts • A Safety & Health Representative to measure the lead content in the painted surface. Accepted methods are XRF measurement or collecting a representative bulk sample for analysis by a laboratory certified by the American Industrial Hygiene Association (AIHA). • A Facility Support Representative to determine/characterize radiation contamination for painted surfaces in radiological areas.
Step 2	The Safety & Health Representative provides guidance for the Work Planner on the lowest, practical dust-generating operation, activity, and procedures. The Safety & Health Representative determines worker-exposure monitoring requirements and approves work practices and worker-protection measures (respiratory protection and protective clothing). Techniques that should be used and those that should be avoided include

	• Avoiding high-dust-generating activities, including grinding, sanding, mechanical buffing, Zamboni buffing, abrasive blasting, sawing, welding, drilling, brazing, torch cutting, burning, rivet busting, or any other high speed tooling of the lead containing painted surface. Such activities may be done on a case-by-case basis, but only with the approval of a Safety & Health Representative. • Selecting low-dust-generating activities, such as manual hand scraping of paint by scraper knife or draw blade, whenever possible. • Hydroblasting may be used on a case by case basis, but only with the permission of a Safety & Health Representative. All components of the Work Planning and Control for Experiments and Operations Subject Area must be incorporated into the documentation of the project.
Step 3	Exposure monitoring is required to determine if the exposure levels may routinely exceed the OSHA Action Level, OSHA Permissible Exposure Limit [PEL], or ACGIH Threshold Limit Value®. Contact a Safety & Health Representative to determine if representative data exists for the operation or if there is a need to perform employee exposure monitoring.
Step 4	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.
Step 5	Contact the Environmental Compliance Representative or Waste Management Representative to determine the appropriate recycle/waste stream for lead-containing construction debris, paint chip debris, collected dust, drop cloths, and disposable PPE. • If approved for recycling, collect lead in containers labeled "Lead for Recycling" (or equivalent wording). Process the container through Procurement & Property Management Division (PPM) following the exhibit Recycling & Disposal of Lead. • If determined to be hazardous waste, follow the Hazardous Waste Management Subject Area. • If the material is radioactive or has radiological contamination, follow the Mixed Waste Management Subject Area. • Label lead-contaminated PPE with the Contaminated PPE Label attached to the exterior of the disposal or laundry shipment bag.
Step 6	Supervisors ensure that workers with a potential airborne exposure to lead have completed training. See the BNL Training and Qualifications website. The BNL contracting organization ensures that contractors provide documentation that demonstrates OSHA-compliant training has been received by all workers who have a potential airborne exposure to lead. **Note:** Potential airborne exposure to lead may be identified through the Work Planning and Control for Experiments and Operations Subject Area, the Facility Hazard Analysis and Risk Assessment Subject Area, the individual's Job Training Assessment (JTA), and/or the Occupational Medical Clinic Lead Monitoring Protocol.

Step 7	Where workers are exposed to lead above the OSHA PEL without regard to the use of respirators, or where workers are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the personal protective requirements in OSHA standard 1910.1025 or 1926.62 must be followed and incorporated in the Work Planning and Control document governing the work. Otherwise/or if none is specified, consult the guidance in Recommendations for Personal Protective Equipment (PPE) during work with Lead in the ESH Guide: Lead. Wash hands after handling lead containing products. Do not take lead contaminated clothing home for cleaning. Do not use high pressure air to clean lead contaminated clothing.
Step 8	Lead Workers protect the work area by spreading a barrier on adjacent surfaces at least 6-feet beyond each dimension of the painted surface to be disturbed. In creating the barrier, workers should • Use 6-mil plastic, burlap, or canvas when dry scraping. Wet the surface covering to hold down dust and trap chips. • Use six 6-mil plastic when hydroblasting. Collect pooled water for proper disposal.
Step 9	Lead Workers conduct lead-paint removal following the precautions and controls stated in departmental written procedures and this subject area. Use these work practices whenever possible: • Post the area with a warning sign to alert unauthorized personnel to stay away. See the exhibit Lead Warning Sign. • Remove lead-coated structures intact, when possible (such as door and window frames) intact. • Separate unpainted surfaces or nonlead containing painted surfaces from lead-based paint surfaces. • Separate radiologically contaminated and non-radiologically contaminated surfaces, whenever possible. • Wet painted surfaces with water to hold down dust. Keep the surface wet throughout paint removal operations. • Use chemical strippers when harmful solvent vapors or caustic mists can be controlled. • Use only HEPA vacuum cleaners when vacuuming surfaces.
Step 10	OMC provides lead medical surveillance upon request, in compliance with 29 CFR 1926.62. The employee's supervisor and ES&H Coordinator request lead medical surveillance by completing an Additional Medical Surveillance Form (AMS) and having the employee report to OMC with the completed form. The Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 requires lead medical surveillance if a worker is or may be exposed to lead at or above the OSHA Action Level of 30 µg/m³ for at least one day within any 12-month period. Request medical surveillance if

	1. Exposure monitoring was performed and shows lead exposure at or above the OSHA Action Level on any day. 2. Exposure monitoring was not performed but the employee conducts this operation for more than 30 minutes per day; The OMC Manager should be contacted at extension 3666: 1. By the employee or supervisor if either have concerns about possible overexposure to lead or possible signs or symptoms of lead toxicity. 2. By the supervisor or ES&H Coordinator for questions about lead medical surveillance requirements. **Note:** The employee and Training Coordinator receive an expiration notice from the Training Database 12 months after initial lead medical surveillance. The supervisor and ES&H Coordinator should request additional surveillance at that time by submitting a new AMS form, if warranted by continuing lead exposure. **Note:** Lead exposure at or above the OSHA Action Level for over 30 days in a 12-month period requires additional blood lead monitoring (see OSHA standard for required monitoring schedule). OMC will schedule this additional monitoring with the employee if the AMS form indicates exposure exceeding 30 days.

References

29 CFR 1926.62, Subpart D - Occupational Health and Environmental Controls, Lead

BNL Training and Qualifications website

Facility Hazard Analysis and Risk Assessment Subject Area

Hazardous Waste Management Subject Area

Job Assessment (JAF) & Additional Medical Surveillance Form (AMS), Human Resources & Occupational Medicine Division website

Mixed Waste Management Subject Area

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

Work Planning and Control for Experiments and Operations Subject Area

PROCEDURE: LEAD SOLDERING: ELECTRONIC COMPONENTS

Management System: Worker Safety and Health		
Subject Area: Lead		
2. Lead Soldering: Electronic Components		
Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to BNL staff and non-BNL staff who perform bench-scale soldering with lead-containing solder on electronic circuit boards and other components with hand-held electric soldering irons or guns.

Required Procedure

Contact your Supervisor, Safety & Health Representative, Facility Support Representative, Environmental Safety and Health Coordinator, Work Control Managers/Coordinator, or the Lead Subject Matter Expert for assistance in obtaining any service below.

Step 1	The Work Planner or staff contacts a Safety & Health Representative to evaluate lead-soldering operations or areas where large-scale operations are conducted or planned to last for 30 days per year. Operations previously evaluated in the Work Planning and Control for Experiments and Operations Subject Area that addressed the lead hazard elements of this subject area are exempted from this additional review.
Step 2	The Safety & Health Representative determines worker-exposure monitoring requirements and approves work practices and worker-protection measures (respiratory protection and protective clothing). Exposure monitoring is required to determine if the exposure levels may routinely exceed the OSHA Action Level, OSHA Permissible Exposure Limit [PEL], or ACGIH Threshold Limit Value®. Contact a Safety & Health Representative to determine if representative data exists for the operation or if there is a need to perform employee exposure monitoring.
Step 3	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards

	posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.
Step 4	The Safety & Health Representative provides guidance for the Work Planner on the lowest, practical dust-generating operation, activity, and procedures. The fumes from electronic soldering contain nonhazardous levels of lead, but do contain hazardous decomposition products from the flux, such as organic acid and aldehydes.
Step 5	Supervisors ensure that workers with a potential airborne exposure to lead have completed training. See the BNL Training and Qualifications website. The BNL contracting organization ensures that contractors provide documentation that demonstrates OSHA-compliant training has been received by all workers who have a potential airborne exposure to lead. **Note:** Potential airborne exposure to lead may be identified through the Work Planning and Control for Experiments and Operations Subject Area, the Facility Hazard Analysis and Risk Assessment Subject Area, the individual's Job Training Assessment (JTA), and/or the Occupational Medical Clinic Lead Monitoring Protocol.
Step 6	Where workers are exposed to lead above the OSHA PEL without regard to the use of respirators, or where workers are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the personal protective requirements in OSHA standard 1910.1025 or 1926.62 must be followed and incorporated in the Work Planning and Control document governing the work. Otherwise/or if none is specified, consult the guidance in Recommendations for Personal Protective Equipment (PPE) during work with Lead in the ESH Guide: Lead. Wash hands after handling lead containing products. Do not take lead contaminated clothing home for cleaning. Do not use high pressure air to clean lead contaminated clothing.
Step 7	Lead Workers solder lead in a manner so that smoke from the soldering is directed away from the breathing zone of all workers. Provide local capture ventilation (elephant trunk type system), when practical.
Step 8	Contact the Environmental Compliance Representative or Waste Management Representative to determine the appropriate recycle/waste stream for lead splatter, droplets, unused solder, collected dust, drop cloths, and disposable PPE. Lead should be recycled whenever possible. • If approved for recycling, collect lead in containers labeled "Lead for Recycling" (or equivalent wording). Process the container through Procurement & Property Management Division (PPM) following the exhibit Recycling & Disposal of Lead. • If determined to be hazardous waste, follow the Hazardous Waste Management Subject Area. • If the material is radioactive or has radiological contamination, follow the Mixed Waste Management Subject Area.
Step 9	

	Lead Workers conduct proper housekeeping of surfaces where lead is used and stored. Wet wipe, maslinn wipe, or use a HEPA vacuum as needed to maintain lead-dust-free areas. Establish a regular schedule of clean-up of the splatters to maintain a lead-free area. **Note:** The Facility Support Representative, Safety & Health Representative, or their designee may conduct post-surface wipe sampling of areas with lead contamination, if appropriate.
Step 10	OMC provides lead medical surveillance upon request, in compliance with 29 CFR 1910.1025. Based on past exposure monitoring, this operation typically does not create worker exposure levels that trigger medical surveillance requirements. However, if the Safety & Health Representative requires exposure monitoring, and the employee's lead exposure is determined to exceed the OSHA Action Level for 30 or more days in a 12 month period, the employee's supervisor and ES&H Coordinator must request lead medical surveillance by completing an Additional Medical Surveillance Form (AMS) and submitting the form to OMC. OMC will then schedule a medical surveillance exam with the employee. The OMC Manager should be contacted at extension 3666: 1. By the employee, or supervisor, if either have concerns about possible overexposure to lead, or possible signs or symptoms of lead toxicity. 2. By the supervisor, or ES&H Coordinator, for questions about lead medical surveillance requirements. **Note:** The employee and Training Coordinator receive an expiration notice from the Training Database 12 months after initial lead medical surveillance. The supervisor and ES&H Coordinator should request continuing surveillance at that time by submitting a new AMS form, if warranted by continuing lead exposure at or above the exposure level and duration triggering a requirement for medical surveillance. **Note:** In accordance with the OSHA General Industry Lead Standard, blood lead monitoring must be repeated 6 months after initial lead medical surveillance. OMC will schedule this additional testing with the employee.

Guidelines

In areas with a high amount of soldering, the room air should not be recycled within the HVAC system. Contact the Lead Subject Matter Expert for an evaluation of the work area.

In determining if existing work planning document is adequate and in preparing work planning and control documentation, consider implications and risks related to

- Hazards and exposure limits;
- Storage requirements;
- Disposal requirements;
- Cost (of the chemical itself, implementing requirements, mitigating impacts, disposal);
- Use requirements;
- Controls on use, storage, and disposal;
- Environmental impacts and environmentally regulated chemicals;
- National Environmental Policy Act (NEPA) documentation requirements (See the National Environmental Policy Act (NEPA) and Cultural Resources Evaluations Subject Area).

Circuit boards with soldered parts should be recycled. Follow the exhibit Recycling & Disposal of Lead.

References

29 CFR 1910.1025, Toxic and Hazardous Substances, Lead

BNL Training and Qualifications website

Facility Hazard Analysis and Risk Assessment Subject Area

Hazardous Waste Management Subject Area

Job Assessment (JAF) & Additional Medical Surveillance Form (AMS), Human Resources Directorate website

National Environmental Policy Act (NEPA) and Cultural Resources Evaluations Subject Area

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

Work Planning and Control for Experiments and Operations Subject Area

PROCEDURE: LEAD SOLDERING: PLUMBING, FLASHING, AND HIGH VOLTAGE LINES (CONSTRUCTION AND BUILDING MAINTENANCE)

Management System: Worker Safety and Health		
Subject Area: Lead		
3. Lead Soldering: Plumbing, Flashing, and High Voltage Lines (Construction and Building Maintenance)		
Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to BNL staff and non-BNL staff who perform soldering with lead-containing solder on building components with hand-held electric soldering irons, guns, or torches.

Required Procedure

Lead-containing solder **must not** be used on potable water supply lines. Recommended alternatives are 50/50 Tin/Antimony solder or equivalent.

Lead solder may be used on wastewater return lines, sewage lines, and nonpotable piping.

Contact your Supervisor, Safety & Health Representative, Environmental Safety and Health Coordinator, Work Control Managers/Coordinator, or the Lead Subject Matter Expert for assistance in obtaining any service below.

Step 1	Work Planner or Staff contacts a Safety & Health Representative to • Evaluate lead-soldering operations/area. Operations previously evaluated in the Work Planning and Control for Experiments and Operations Subject Area that addressed the lead hazard are exempted from this additional review. • Determine worker-exposure monitoring requirements and to approve work practices and worker-protection measures respiratory protection and protective clothing). Lead Workers must wear exposure-monitoring equipment as required by the Safety & Health Representative assigned to the operation.

	Note: Operations that are conducted daily or routinely can have a pre-determined exposure assessment schedule established by a Safety & Health Representative.
Step 2	The Safety & Health Representative provides guidance for the Work Planner to use the lowest fume-generating technique possible. The fumes from soldering contain nonhazardous levels of lead, but do contain hazardous decomposition products from the flux, such as organic acids and aldehydes.
Step 3	Supervisors ensure that workers with a potential airborne exposure to lead have completed training. See the BNL Training and Qualifications website. The BNL contracting organization ensures that contractors provide documentation that demonstrates OSHA-compliant training has been received by all workers who have a potential airborne exposure to lead. **Note:** Potential airborne exposure to lead may be identified through the Work Planning and Control for Experiments and Operations Subject Area, the Facility Hazard Analysis and Risk Assessment Subject Area, the individual's Job Training Assessment (JTA), and/or the Occupational Medical Clinic Lead Monitoring Protocol.
Step 4	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.
Step 5	Lead Workers solder lead in a manner so that smoke from the soldering operation is directed away from the breathing zone of all workers. Provide local capture ventilation (elephant trunk type system), when practical.
Step 6	Where workers are exposed to lead above the OSHA PEL without regard to the use of respirators, or where workers are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the personal protective requirements in OSHA standard 1910.1025 or 1926.62 must be followed and incorporated in the Work Planning and Control document governing the work. Otherwise/or if none is specified, consult the guidance in Recommendations for Personal Protective Equipment (PPE) during work with Lead in the ESH Guide: Lead. Wash hands after handling lead containing products. Do not take lead contaminated clothing home for cleaning. Do not use high pressure air to clean lead contaminated clothing.
Step 7	Lead Workers conduct proper housekeeping of surfaces where lead is used and stored. Wet wipe, maslinn wipe, or use a HEPA vacuum as needed to maintain lead-dust-free areas. **Note:** The Safety & Health Representative may conduct post-surface wipe sampling of areas with lead contamination, if appropriate.
Step 8	Contact the Environmental Compliance Representative or Waste Management Representative to determine the appropriate recycle/waste stream for collected lead splatter, droplets, unused solder, collected dust, drop cloths, and disposable PPE. Lead should be recycled whenever possible.

	• If approved for recycling, collect lead in containers labeled "Lead for Recycling" (or equivalent wording). Process the container through Procurement & Property Management Division (PPM) following the exhibit Recycling & Disposal of Lead. • If determined to be hazardous waste, follow the Hazardous Waste Management Subject Area. • If the material is radioactive or has radiological contamination, follow the Mixed Waste Management Subject Area.
Step 9	OMC provides lead medical surveillance upon request, in compliance with 29 CFR 1926.62. Based on past exposure monitoring, this operation typically does not create worker exposure levels that trigger medical surveillance requirements. However, if the Safety & Health Representative requires exposure monitoring, and this monitoring shows employee lead exposure exceeding the OSHA Action Level on any day, the employee's supervisor and ES&H Coordinator request lead medical surveillance by completing an Additional Medical Surveillance Form (AMS) and having the employee report to OMC with the completed form. The Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 requires lead medical surveillance if a worker is or may be exposed to lead at or above the OSHA Action Level of 30 ug/m3 for at least one day within any 12-month period. Request Medical surveillance if • Exposure monitoring was performed and shows lead exposure at or above the OSHA Action Level on any day. • Exposure monitoring was not performed but the employee conducts this operation for more than 30 minutes per day. The OMC Manager should be contacted at extension 3666: 1. By the employee, or supervisor, if either have concerns about possible overexposure to lead or possible signs or symptoms of lead toxicity. 2. By the supervisor, or ES&H Coordinator, for questions about lead medical surveillance requirements. **Note:** The employee and Training Coordinator receive an expiration notice from the Training Database 12 months after initial lead medical surveillance. The supervisor and ES&H Coordinator should request continuation of lead surveillance at that time by submitting a new AMS form, if warranted by continuing lead exposure at or above the Action Level. **Note:** Lead exposure at or above the OSHA Action Level for over 30 days in a 12-month period requires additional blood lead monitoring (see OSHA standard for required monitoring schedule). OMC will schedule this additional testing with the employee if the AMS form indicates exposure exceeding 30 days.
Step 10	Lead Workers dispose of lead-containing debris (including decontamination cleanup material, e.g., vacuum debris and wipe rags) through the Environmental Protection Division (EPD). Waste material will be hazardous waste and must be disposed of according to guidance from the EPD. Follow the Hazardous Waste Management Subject Area before generating the waste. If the material is also radioactive, follow the Mixed Waste Management Subject Area.

	Contact the Waste Management Representative for the Department/Division, or the Hazardous Waste Program Manager, for guidance with the disposal of waste. Label lead-contaminated PPE with the Contaminated PPE Label attached to the exterior of the disposal or laundry shipment bag.

Guidelines

In areas with a high amount of soldering, the room air should not be recycled within the HVAC system. Contact the Lead Subject Matter Expert for an evaluation of the work operation.

In determining if existing work planning document is adequate and in preparing work planning and control documentation, consider implications and risks related to

- Hazards and exposure limits;
- Storage requirements;
- Disposal requirements;
- Cost (of the chemical itself, implementing requirements, mitigating impacts, disposal);
- Use requirements;
- Controls on use, storage, and disposal;
- Environmental impacts and environmentally regulated chemicals;
- National Environmental Policy Act (NEPA) documentation requirements (See the National Environmental Policy Act (NEPA) and Cultural Resources Evaluations Subject Area).

References

29 CFR 1926.62, Occupational Health and Environmental Controls, Lead

BNL Training and Qualifications website

Facility Hazard Analysis and Risk Assessment Subject Area

Hazardous Waste Management Subject Area

Job Assessment (JAF) & Additional Medical Surveillance Form (AMS), Human Resources & Occupational Medicine Division website

Mixed Waste Management Subject Area

National Environmental Policy Act (NEPA) and Cultural Resources Evaluations Subject Area

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

Work Planning and Control for Experiments and Operations Subject Area

PROCEDURE: LEAD SHIELDING AND BALLAST

Management System: Worker Safety and Health		
Subject Area: Lead		
4. Lead Shielding and Ballast		
Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to BNL staff and non-BNL staff who handle lead bricks, sheets, wool or plates in radiation shielding or ballast weight. It does not apply to cutting, drilling, machining, or other alteration of the shape of lead shielding or ballast material (which is covered in the section Lead Machining and Fabrication), and handling of fully encapsulated lead (such as bricks wrapped in tape, dipped in PVC coating).

Required Procedure

Contact your Supervisor, Safety & Health Representative, Facility Support Representative, Environmental Safety and Health Coordinator, Work Control Managers/Coordinator, or the Lead Subject Matter Expert for assistance in obtaining any service below.

Step 1	Line Management or the Work Planner contacts a Safety & Health Representative to evaluate lead shielding or ballast handling involving more than 30 minutes of contact time per person per day with the lead material. For operations of less than 30 minutes in duration, consult the Safety & Health Representative for good housekeeping practices, use of Personal Protective Equipment (PPE), and personal hygiene practices. Operations previously evaluated in the Work Planning and Control for Experiments and Operations Subject Area that addressed the lead hazard are exempted from this additional review.
Step 2	The Safety & Health Representative • Evaluates the oxidation level of the lead material and determines if preliminary oxidation removal will significantly reduce worker exposure to airborne lead during handling; • Plans the work to use the lowest dust-generating operation, activity, and procedures possible;

	• Determines worker-exposure monitoring requirements and approves work practices and worker-protection measures (respiratory protection and protective clothing).
Step 3	Line Management or the Work Planner contacts the Facility Support Representative to arrange for determining/characterizing radiation contamination of lead material in radiological areas before disturbing the shielding or ballast material.
Step 4	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.
Step 5	Contact the Environmental Compliance Representative or Waste Management Representative to determine the appropriate recycle/waste stream for un-needed lead ballast, shielding pieces, collected dust, drop cloths, and disposable PPE. Lead should be recycled whenever possible, if it is clean of radioactivity. • If approved for recycling, collect lead in containers labeled "Lead for Recycling" (or equivalent wording). Process the container through Procurement & Property Management Division (PPM) following the exhibit Recycling & Disposal of Lead. • If determined to be hazardous waste, follow the Hazardous Waste Management Subject Area. • If the material is radioactive or has radiological contamination, follow the Mixed Waste Management Subject Area. • Label lead-contaminated personal protective equipment (PPE) with the Contaminated PPE Label attached to the exterior of the dispoal or laundry shipment bag. • Test paint chips from lead bricks by XRF/lab analysis or treat as hazardous waste.
Step 6	Supervisors ensure that workers with a potential airborne exposure to lead have completed training. See the BNL Training and Qualifications website. The BNL contracting organization ensures that contractors provide documentation that demonstrates OSHA-compliant training has been received by all workers who have a potential airborne exposure to lead. **Note:** Potential airborne exposure to lead may be identified through the Work Planning and Control for Experiments and Operations Subject Area, the Facility Hazard Analysis and Risk Assessment Subject Area, the individual's Job Training Assessment (JTA), and/or the Occupational Medical Clinic Lead Monitoring Protocol.
Step 7	Exposure monitoring is required to determine if the exposure levels may routinely exceed the OSHA Action Level, OSHA Permissible Exposure Limit [PEL], or ACGIH Threshold Limit Value®. Contact a Safety & Health Representative to determine if representative data exists for the operation or if there is a need to perform employee exposure monitoring.

	Lead Workers wear exposure-monitoring equipment as required by the Safety & Health Representative. Use PPE, such as gloves, body covering, and respiratory protection, as required by the Safety & Health Representative and departmental written procedures on lead use.
Step 8	Where workers are exposed to lead above the OSHA PEL without regard to the use of respirators, or where workers are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the personal protective requirements in OSHA standard 1910.1025 or 1926.62 must be followed and incorporated in the Work Planning and Control document governing the work. Otherwise/or if none is specified, consult the guidance in Recommendations for Personal Protective Equipment (PPE) during work with Lead in the ESH Guide: Lead. Wash hands after handling lead containing products. Do not take lead contaminated clothing home for cleaning. Do not use high pressure air to clean lead contaminated clothing.
Step 9	Lead Workers conduct handling operations following the precautions and controls stated in departmental written procedures (if available), the work planning documentation, and this subject area. Use these work practices, whenever possible: • Separate radiologically contaminated and non-radiologically contaminated surfaces, whenever possible. • Use only HEPA vacuum cleaners.
Step 10	Lead Workers conduct proper housekeeping of surfaces where lead is used and stored. Wet wipe, masslinn wipe, or use a HEPA vacuum as needed to maintain lead dust-free areas. **Note:** The Safety & Health Representative may conduct post-surface wipe sampling of areas with lead contamination, if appropriate.
Step 11	OMC provides lead medical surveillance upon request, in compliance with 29 CFR 1910.1025. The employee's supervisor and ES&H Coordinator request lead medical surveillance by completing an Additional Medical Surveillance Form (AMS) and having the employee report to OMC with the completed form. Lead exposure at or above the OSHA Action Level for over 30 days in a 12-month period requires additional blood lead monitoring (see OSHA standard for required monitoring schedule). OMC will schedule this additional monitoring with the employee if the AMS form indicates exposure exceeding 30 days. Request medical surveillance if 1. Exposure monitoring was performed and shows lead exposure at or above the OSHA Action Level for 30 days. 2. Exposure monitoring was not performed, but the employee conducts this operation for more than 30 minutes per day for 30 days. The OMC Manager should be contacted at extension 3666: 1. By the employee, or supervisor, if either have concerns about possible overexposure to lead or possible signs or symptoms of lead toxicity.

	2. By the supervisor, or ES&H Coordinator, for questions about lead medical surveillance requirements. **Note:** The employee and Training Coordinator receive an expiration notice from the Training Database 12 months after initial lead medical surveillance. The supervisor and ES&H Coordinator should request additional surveillance at that time by submitting a new AMS form, if warranted by continuing lead exposure.

Guidelines

The following techniques reduce lead exposure from shielding material:

- Enclosing lead structures or encapsulating lead bricks in PVC coating or electrical or duct tape prevents potential worker exposure to surface lead and should be used whenever practical. (Evaluate the potential for activation of the coating in radiological shielding use and avoid coating if activation is possible). Cover piles of lead bricks with a plastic sheet whenever possible.
- Washing the surfaces of oxidized lead material with 10% acetic acid (vinegar) can eliminate loose dust and reduce exposure potential. Treat the rinse as hazardous waste.
- Paint bricks with latex or enamel paint to protect surfaces that will not be handled frequently or receive damage from abrasion or striking by moving equipment.
- Consider replacing lead in shielding material with other material with high density. Substitute materials include cast iron, steel, "Kirksite" and "HeavyMetal."
- Use "sticky step off" pads at entrances to lead-dust-contaminated areas.
- Cover surfaces with blotter paper, aluminum foil, or plastic to minimize surface contamination.
- Use a HEPA vacuum on shielding surfaces before handling to reduce loose lead oxide.
- Use dedicated lead HEPA vacuums that are not used with radioactive contamination to avoid creating mixed waste, whenever possible.
- Use a HEPA vacuum on nondisposable PPE clothing to reduce contamination and send clothing to BNL laundry service for cleaning as necessary.
- As a pollution prevention measure, contact other organizations to determine if extra lead bricks are available before purchasing new ones.

References

29 CFR 1910.1025, Toxic and Hazardous Substances, Lead

BNL Training and Qualifications website

Facility Hazard Analysis and Risk Assessment Subject Area

Hazardous Waste Management Subject Area

Job Assessment (JAF) & Additional Medical Surveillance Form (AMS), Human Resources & Occupational Medicine Division website

Mixed Waste Management Subject Area

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

Work Planning and Control for Experiments and Operations Subject Area

PROCEDURE: LEAD IN FIREARMS USE

Management System: Worker Safety and Health		
Subject Area: Lead		
5. Lead in Firearms Use		
Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to BNL staff who use firearms in qualification and practice during their employment at BNL. It also applies to BNL staff and non-BNL staff who sift the berm at the firing range to remove lead shot from the soil.

Required Procedure

Lead in Firearms Use contains two subsections:

5.1 Discharging of Firearms in Qualification or Practice
5.2 Berm Sifting at the Firing Range

5.1 Discharging of Firearms in Qualification or Practice

Step 1	Supervisors ensure that workers with a potential airborne exposure to lead have completed training. See the BNL Training and Qualifications website. **Note:** Potential airborne exposure to lead may be identified through the Work Planning and Control for Experiments and Operations Subject Area, the Facility Hazard Analysis and Risk Assessment Subject Area, the individual's Job Training Assessment (JTA), and/or the Occupational Medical Clinic Lead Monitoring Protocol.
Step 2	The Safeguards and Security Division (SSD) informs the Safety & Health Representative that occupational exposure monitoring is required for the firing session.
Step 3	The Safety & Health Representative conducts occupational exposure monitoring for the firing session.
Step 4	Staff must minimize exposure to discharging firearms to the shortest time possible and move from the firing line as quickly as is safely possible, following the instructions of the

	Range Officer. (Exposure to lead in discharging a firearm is above background levels. Discharging a firearm for over 2 hours may result in exposure to lead fumes above the Occupational Exposure Limit.) **Note:** Based on BNL historic exposure monitoring data, compliance with the action level and employee exposure limit may be administratively controlled by the following: • Safeguards and Security Division: Limit firearm discharging to less than 60 minutes per day. If circumstances require practice or qualification to exceed 60 minutes, contact the Safety & Health Representative to evaluate engineering, administrative controls, and personal protective equipment that will ensure compliance with the OSHA Action Level for the shooters and range instructors. SSD is responsible for controlling exposure of their workers to lead via appropriate engineering and administrative controls and personal protective equipment.
Step 5	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.
Step 6	Non-BNL users of BNL range facilities must sign and return to the Safeguards and Security Division an Outside Agency User Statement and an Application for Use of BNL Firearms Range for Non-DOE Purposes. Non-BNL user organizations are responsible for • Controlling exposure of their workers to lead via appropriate engineering and administrative controls and personal protective equipment; • Establishing appropriate range safety controls for their sessions.
Step 7	Discharging firearms may result in occupational exposure that triggers Occupational Medicine Clinic (OMC) medical surveillance. Unless objective exposure monitoring data indicate acceptable exposure levels, the Department/Division must notify the OMC of the need for medical surveillance if the employee discharges the firearm for more than 60 minutes/day for 30 or more days per year. **Note:** Medical surveillance evaluations are provided at least annually thereafter on lead workers that remain in these conditions. **Note**: Departments/Divisions may develop alternative OMC notification protocols for lead workers that meet the intent of the OSHA requirements and are approved by the Lead Subject Matter Expert.

5.2 Berm Sifting at the Firing Range

The Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 requires lead medical surveillance if a worker is or may be exposed to lead at or above the OSHA Action Level of 30 ug/m3 for at least one day within any 12-month period.

Contact your Supervisor, Safety & Health Representative, Facility Support Representative, Environmental Safety and Health Coordinator, Work Control Managers/Coordinator, or the Lead Subject Matter Expert for assistance in obtaining any service below.

Step 1	Line Management or Work Planner contacts the Safety & Health Representative to arrange for an evaluation of the operation.
Step 2	The Safety & Health Representative determines acceptable practices for handling the lead material, worker-exposure monitoring requirements and work practices, and worker protection measures respiratory protection and protective clothing).
Step 3	The Safety & Health Representative conducts occupational exposure monitoring, if required, for the sifting operation.
Step 4	The Safety & Health Representative provides guidance for the Work Planner on the lowest, practical dust-generating operation, activity, and procedures. The dust from the berm contains lead particulate.
Step 5	Supervisors ensure that workers with a potential airborne exposure to lead have completed training. See the BNL Training and Qualifications website. The BNL contracting organization ensures that contractors provide documentation that demonstrates OSHA-compliant training has been received by all workers who have a potential airborne exposure to lead. **Note:** Potential airborne exposure to lead may be identified through the Work Planning and Control for Experiments and Operations Subject Area, the Facility Hazard Analysis and Risk Assessment Subject Area, the individual's Job Training Assessment (JTA), and/or the Occupational Medical Clinic Lead Monitoring Protocol.
Step 6	Where workers are exposed to lead above the OSHA PEL without regard to the use of respirators, or where workers are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the personal protective requirements in OSHA standard 1910.1025 or 1926.62 must be followed and incorporated in the Work Planning and Control document governing the work. Otherwise/or if none is specified, consult the guidance in Recommendations for Personal Protective Equipment (PPE) during work with Lead in the ESH Guide: Lead. Wash hands after handling lead containing products. Do not take lead contaminated clothing home for cleaning. Do not use high pressure air to clean lead contaminated clothing.
Step 7	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.
Step 8	

	Workers use controls to minimize exposure: • Spread plastic beneath the wheel barrow and screen to minimize spreading lead debris; • Wear disposable body covering suit to prevent lead contamination; • Wear respiratory protection if it is determined to be required by the Safety & Health Representative.
Step 9	Collect bullet fragments in containers labeled "Lead for Recycling" (or equivalent wording). Process the container through Procurement & Property Management Division (PPM) following the exhibit Recycling & Disposal of Lead.
Step 10	OMC provides lead medical surveillance upon request, in compliance with 29 CFR 1910.1025. Based on past exposure monitoring, this operation typically does not create worker exposure levels that trigger medical surveillance requirements. However, if the Safety & Health Representative requires exposure monitoring, and this monitoring shows employee lead exposure exceeding the OSHA Action Level for 30 days, the employee's supervisor and ES&H Coordinator request lead medical surveillance by completing an Additional Medical Surveillance Form (AMS) and having the employee report to OMC with the completed form. The OMC Manager should be contacted at extension 3666: 1. By the employee or supervisor if either have concerns about possible overexposure to lead or possible signs or symptoms of lead toxicity. 2. By the supervisor or ES&H Coordinator for questions about lead medical surveillance requirements. **Note:** The employee and Training Coordinator receive an expiration notice from the Training Database 12 months after initial lead medical surveillance. The supervisor and ES&H Coordinator should request continuation of lead surveillance at that time by submitting a new AMS form, if warranted by continuing lead exposure at or above the Action Level. **Note:** Lead exposure at or above the OSHA Action Level for over 30 days in a 12-month period requires additional blood lead monitoring (see OSHA standard for required monitoring schedule). OMC will schedule this additional testing with the employee if the AMS form indicates exposure exceeding 30 days.
Step 11	Workers dispose of decontamination clean-up material (HEPA vacuum debris and wipe rags) through the Environmental Protection Division (EPD). Follow the Hazardous Waste Management Subject Area before generating the waste. Contact the Waste Management Representative for the Department/Division, or the Hazardous Waste Program Manager, for guidance with the disposal of waste. Label lead-contaminated PPE with the Contaminated PPE Label attached to the exterior of the disposal or laundry shipment bag.

Guidelines

Dedicate a separate area for the collection of mixed waste, to ensure its segregation from nonradioactive hazardous waste by taping off the area, or better still, erecting/using a physical barrier.

A sufficient number of people should receive 90-Day Accumulation Area Manager training to ensure coverage in the event of the Accumulation Area Manager's absence.

If a telephone is used to fulfill the requirements in step 6, the area's location (building and room number) should be posted adjacent to the telephone.

References

29 CFR 1910.1025, Toxic and Hazardous Substances, Lead

BNL Training and Qualifications website

Facility Hazard Analysis and Risk Assessment Subject Area

Hazardous Waste Management Subject Area

Job Assessment (JAF) & Additional Medical Surveillance Form (AMS), Human Resources & Occupational Medicine Division website

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

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Questions/Comments Disclaimer

https://sbms.bnl.gov/sbmsearch/subjarea/114/114_pro5.cfm

PROCEDURE: LEAD MACHINING AND FABRICATION

Management System: Worker Safety and Health		
Subject Area: Lead		
6. Lead Machining and Fabrication		
Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to BNL staff and non-BNL staff who alter the shape of lead bricks, sheets, or plates in radiation shielding or ballast weight material using powered or hand tools. It applies to those working in machine shop areas or on-site work fabrication.

Required Procedure

The Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 requires lead medical surveillance if a worker is or may be exposed to lead at or above the OSHA Action Level of 30 ug/m3 for at least one day within any 12-month period.

Contact your Supervisor, Safety & Health Representative, Facility Support Representative, Environmental Safety and Health Coordinator, Work Control Managers/Coordinator, or the Lead Subject Matter Expert for assistance in obtaining any service below.

Step 1	Line Management or the Work Planner contacts a Safety & Health Representative to evaluate the lead machining or fabrication operations. Exemptions to formal evaluation are the following: • Operations that are conducted in established lead-machining areas that have received previous approval of a Safety & Health Representative and are of the same size, duration, and work practices as previous work; • Operations in lead-handling areas that involve shearing lead sheets, cutting lead sheets, or bricks with nonpowered hand tools, band saw, or power hacksaw cutting of lead sheets or bricks with oil or coolant flood that is captured; • Operations previously evaluated in Work Planning and Control for Experiments and Operations Subject Area (that addressed the lead hazard), or National Synchrotron Light Source (NSLS) Shielding Configuration Control permits. **Note:** Operations that are conducted daily or routinely can have a pre-determined exposure assessment schedule established by a Safety & Health Representative.

Step 2	Line Management or the Work Planner contacts the Facility Support Representative and the Safety & Health Representative to arrange for • A Facility Support Representative to determine/characterize radiation contamination of lead material in radiological areas before machining or fabricating lead material from radiological areas; • A Safety & Health Representative to evaluate the oxidation level of the lead material and determine if preliminary decontamination is appropriate.
Step 3	The Safety & Health Representative • Provides guidance for the Work Planner on the lowest, practical dust-generating operation, activity, and procedures; • Determines worker-exposure monitoring requirements, and approves work practices and worker-protection measures (respiratory protection and protective clothing).
Step 4	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.
Step 5	Contact the Environmental Compliance Representative or Waste Management Representative before lead machining to determine the appropriate recycle/waste stream for lead tailings, scraps, leftover pieces, collected dust, drop cloths, and disposable PPE. • If approved for recycling, collect lead in containers labeled "Lead for Recycling" (or equivalent wording). Process the container through Procurement & Property Management Division (PPM) following the exhibit Recycling & Disposal of Lead. • If determined to be hazardous waste, follow the Hazardous Waste Management Subject Area. • If the material is radioactive or has radiological contamination, follow the Mixed Waste Management Subject Area. • Label lead-contaminated personal protective equipment (PPE) with the Contaminated PPE Label attached to the exterior of the disposal or laundry shipment bag.
Step 6	Supervisors ensure that workers with a potential airborne exposure to lead have completed training. See the BNL Training and Qualifications website. The BNL contracting organization ensures that contractors provide documentation that demonstrates OSHA-compliant training has been received by all workers who have a potential airborne exposure to lead. **Note:** Potential airborne exposure to lead may be identified through the Work Planning and Control for Experiments and Operations Subject Area, the Facility Hazard Analysis

	and Risk Assessment Subject Area, the individual's Job Training Assessment (JTA), and/or the Occupational Medical Clinic Lead Monitoring Protocol.
Step 7	Exposure monitoring is required to determine if the exposure levels may routinely exceed the OSHA Action Level, OSHA Permissible Exposure Limit [PEL], or ACGIH Threshold Limit Value®. Contact a Safety & Health Representative to determine if representative data exists for the operation or if there is a need to perform employee exposure monitoring. Lead Workers wear exposure-monitoring equipment as required by the Safety & Health Representative. Use personal protective equipment (PPE), such as gloves, impervious suits, and respiratory protection as required by the Safety & Health Representative and departmental written procedures on lead use, if applicable.
Step 8	Where workers are exposed to lead above the OSHA PEL without regard to the use of respirators, or where workers are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the personal protective requirements in OSHA standard 1910.1025 or 1926.62 must be followed and incorporated in the Work Planning and Control document governing the work. Otherwise/or if none is specified, consult the guidance in Recommendations for Personal Protective Equipment (PPE) during work with Lead in the ESH Guide: Lead. Wash hands after handling lead containing products. Do not take lead contaminated clothing home for cleaning. Do not use high pressure air to clean lead contaminated clothing.
Step 9	Lead Workers conduct operations following the precautions and controls stated in departmental written procedures and this subject area. Use these work practices whenever possible: • Separate radiologically contaminated and non-radiologically contaminated surfaces, whenever possible. • Use only HEPA vacuum cleaners to vacuum surfaces.
Step 10	Lead Workers conduct proper housekeeping of surfaces where lead is used and stored. Wet wipe, masslinn wipe, or use a HEPA vacuum on surfaces as needed to maintain lead dust-free areas. Establish a regular schedule of clean-up of the debris to maintain a lead-free area. **Note:** The Safety & Health Representative may conduct post-surface wipe sampling of areas with lead contamination, if appropriate.
Step 11	OMC provides lead medical surveillance upon request, in compliance with 29 CFR 1926.62 and 29 CFR 1910.1025. Based on past exposure monitoring, this operation typically does not create worker exposure levels that trigger medical surveillance requirements. However, if the Safety & Health Representative requires exposure monitoring, and the employee's lead exposure is determined to exceed the OSHA Action Level for 30 or more days in a 12-month period, the employee's supervisor and ES&H Coordinator must request lead medical surveillance by completing an Additional Medical Surveillance Form (AMS) and submitting the form to OMC. OMC will then schedule a medical surveillance exam with the employee.

	The OMC Manager should be contacted at extension 3666: 1. By the employee or supervisor if either have concerns about possible overexposure to lead or possible signs or symptoms of lead toxicity. 2. By the supervisor or ES&H Coordinator for questions about lead medical surveillance requirements. **Note:** The employee and Training Coordinator receive an expiration notice from the Training Database 12 months after initial lead medical surveillance. The supervisor and ES&H Coordinator should request continuing surveillance at that time by submitting a new AMS form, if warranted by continuing lead exposure at or above the exposure level and duration triggering a requirement for medical surveillance. **Note:** In accordance with the OSHA General Industry Lead Standard, blood lead monitoring must be repeated 6 months after initial lead medical surveillance. OMC will schedule this additional testing with the employee.

References

29 CFR 1910.1025, Toxic and Hazardous Substances, Lead

29 CFR 1926.62, Occupational Health and Environmental Controls, Lead

BNL Training and Qualifications website

Facility Hazard Analysis and Risk Assessment Subject Area

Hazardous Waste Management Subject Area

Job Assessment (JAF) & Additional Medical Surveillance Form (AMS), Human Resources & Occupational Medicine Division website

Mixed Waste Management Subject Area

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

Work Planning and Control for Experiments and Operations Subject Area

PROCEDURE: LEAD IN LABORATORY-SCALE USE

Management System: Worker Safety and Health		
Subject Area: Lead		
7. Lead in Laboratory-scale Use		
Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to BNL staff and non-BNL staff who use lead and lead-containing compounds in bench-scale laboratory work, including synthesis, analysis, testing, reactions, and other experimental use that is covered by 29 CFR 1910.1450, Laboratory Hygiene Plan.

Required Procedure

Step 1	Follow the Chemical Safety Subject Area for procedures on laboratory scale use of chemicals, including lead. **Note:** Use techniques from the Guidelines section below, when applicable.
Step 2	Where workers are exposed to lead above the OSHA PEL without regard to the use of respirators, or where workers are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the personal protective requirements in OSHA standard 1910.1025 or 1926.62 must be followed and incorporated in the Work Planning and Control document governing the work. Otherwise/or if none is specified, consult the guidance in Recommendations for Personal Protective Equipment (PPE) during work with Lead in the ESH Guide: Lead. Wash hands after handling lead containing products. Do not take lead contaminated clothing home for cleaning. Do not use high pressure air to clean lead contaminated clothing..
Step 3	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.

Guidelines

Consider doing the following when working with lead:

- Use lead in a laboratory hood or with other engineering controls that eliminate employee exposure.
- Substitute less hazardous metals or compounds, whenever possible.
- Encapsulate lead bricks used for ballast (weighting down) laboratory equipment, such as ring stands.
- Substitute other less hazardous ballast material, such as steel, Kirksite, or concrete blocks.

References

29 CFR 1910.1450, Laboratory Hygiene Plan

Chemical Safety Subject Area

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

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Questions/Comments Disclaimer

https://sbms.bnl.gov/sbmsearch/subjarea/114/114_pro7.cfm

PROCEDURE: LEAD IN DRINKING WATER

Management System: Worker Safety and Health		
Subject Area: Lead		
8. Lead in Drinking Water		
Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to occupants of all BNL buildings where potable water is supplied.

Required Procedure

Step 1	If there is a concern of possible lead contamination in the drinking water, contact your Environmental Compliance Representative, or your Environmental Safety and Health Coordinator, to arrange for a sample of potable water from drinking fountains or kitchen faucets. Contact the Occupational Medical Clinic (OMC) Manager at extension 3666 for any related health concerns. **Note:** For more information on the quality of BNL's potable water, see the • Most recent BNL Water Quality Consumer Confidence Report; • Monthly Potable Water reports to the Suffolk County Department of Health Services on the Environmental Protection Division website, Discharge Monitoring and Water Treatment Plant Reports; • Annual Site Environmental Report.
Step 2	To ensure adequate flushing of infrequently used potable water supplies, run tap water for 5 minutes or until cold before use.

References

BNL Water Quality Consumer Confidence Report

Discharge Monitoring and Water Treatment Plant Reports, Environmental Protection Division website

Site Environmental Report, Environmental Protection Division website

https://sbms.bnl.gov/sbmsearch/subjarea/114/114_pro8.cfm

PROCEDURE: MELTING LEAD

Management System: Worker Safety and Health
Subject Area: Lead
9. Melting Lead

Effective Date: **Jun 10, 2016**	Subject Matter Expert: Nicole Bernholc	Management System Executive: Ed Nowak

Applicability

This information applies to BNL staff who work with apparatus and are involved in operations at a BNL facility in which lead or lead alloys are melted and poured into molds for creating objects of unique shape. It also applies to BNL staff who work with apparatus and are involved in operations at a BNL facility in which lead or lead alloys are melted and poured into vessels to reduce the volume of the lead for disposal purposes.

Required Procedure

The Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 requires lead medical surveillance if a worker is or may be exposed to lead at or above the OSHA Action Level of 30 $\mu g/m^3$ for at least one day within any 12-month period.

Contact your Supervisor, Safety & Health Representative, Facility Support Representative, Environmental Safety and Health Coordinator, Work Control Managers/Coordinator, or the Lead Subject Matter Expert for assistance in obtaining any service below.

Step 1	Line Management or the Work Planner contacts a Safety & Health Representative to evaluate lead-melting operations and areas.
Step 2	The Safety & Health Representative determines worker-exposure monitoring requirements and approves work practices and worker-protection measures (respiratory protection and protective clothing). Operations previously evaluated in Work Planning and Control for Experiments and Operations Subject Area, that addressed the lead hazard, are exempted from this additional review.
Step 3	Line Management or the Work Planner contacts the Environmental Compliance Representative to determine the need for an EPA Air Emission Permit for the operation.

Step 4	The Safety & Health Representative provides guidance for the Work Planner on the lowest, practical dust-generating operation, activity, and procedures. The atmosphere above lead-melting apparatus is free of hazardous levels of lead fumes, but exposure to airborne lead can occur from • Improper handling of lead-dust-contaminated material before melting; or • Poor control of splashes in pouring steps.
Step 5	Supervisors ensure that workers with a potential airborne exposure to lead have completed training. See the BNL Training and Qualifications website. The BNL contracting organization ensures that contractors provide documentation that demonstrates OSHA-compliant training has been received by all workers who have a potential airborne exposure to lead. **Note:** Potential airborne exposure to lead may be identified through the Work Planning and Control for Experiments and Operations Subject Area, the Facility Hazard Analysis and Risk Assessment Subject Area, the individual's Job Training Assessment (JTA), and/or the Occupational Medical Clinic Lead Monitoring Protocol.
Step 6	Exposure monitoring is required to determine if the exposure levels may routinely exceed the OSHA Action Level, OSHA Permissible Exposure Limit [PEL], or ACGIH Threshold Limit Value®. Contact a Safety & Health Representative to determine if representative data exists for the operation or if there is a need to perform employee exposure monitoring. Lead Workers wear exposure-monitoring equipment as required by the Safety & Health Representative. Use personal protective equipment (PPE), such as gloves, impervious suits, and respiratory protection as required by the Safety & Health Representative and departmental written procedures on lead use, if applicable. Verify that the PPE is safe for high-temperature applications.
Step 7	When the workforce comprises workers of reproductive age, perform an occupational workplace evaluation to determine if there is unacceptable risk from reproductive hazards posed to the worker(s). If so, supervisors reassess job assignments and controls to eliminate the hazard. Consult the exhibit Reproductive Hazards of Lead for information on the reproductive hazards of lead exposure.
Step 8	Where workers are exposed to lead above the OSHA PEL without regard to the use of respirators, or where workers are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the personal protective requirements in OSHA standard 1910.1025 or 1926.62 must be followed and incorporated in the Work Planning and Control document governing the work. Otherwise/or if none is specified, consult the guidance in Recommendations for Personal Protective Equipment (PPE) during work with Lead in the ESH Guide: Lead. Wash hands after handling lead containing products. Do not take lead contaminated clothing home for cleaning. Do not use high pressure air to clean lead contaminated clothing.
Step 9	Lead Workers melt lead in a manner so that atmosphere from the apparatus is directed away from the breathing zone of all workers. Provide local capture ventilation whenever feasible.

Step 10	Lead Workers conduct proper housekeeping of surfaces where lead is used and stored. Wet wipe, masslinn wipe, or use a HEPA vacuum as needed to maintain lead-dust-free areas. Establish a regular schedule of clean-up of the splatters to maintain a lead-free area. **Note:** The Safety & Health Representative may conduct post-surface wipe sampling of areas with lead contamination, if appropriate.
Step 11	Contact the Environmental Compliance Representative or Waste Management Representative to determine the appropriate means to handle and/or collect lead splatter, tailings, droplets, and unused portions. • If approved for recycling, collect lead in containers labeled "Lead for Recycling" (or equivalent wording). Process the container through Procurement & Property Management Division (PPM) following the exhibit Recycling & Disposal of Lead. • If determined to be hazardous waste, follow the Hazardous Waste Management Subject Area. • If the material is radioactive or has radiological contamination, follow the Mixed Waste Management Subject Area.
Step 12	OMC provides lead medical surveillance upon request, in compliance with 29 CFR 1910.1025. Based on past exposure monitoring, it is known that this operation typically does not create worker-exposure levels that trigger medical surveillance requirements. However, if the Safety & Health Representative requires exposure monitoring, and the employee's lead exposure is determined to exceed the OSHA Action level for 30 or more days in a 12-month period, the employee's supervisor and ES&H Coordinator must request lead medical surveillance by completing an Additional Medical Surveillance Form (AMS) and submitting the completed form. OMC will then schedule a medical surveillance examination with the employee. The OMC Manager should be contacted at extension 3666: 1. By the employee or supervisor if either have concerns about possible overexposure to lead or possible signs or symptoms of lead toxicity. 2. By the supervisor or ES&H Coordinator for questions about lead medical surveillance requirements. **Note:** The employee and Training Coordinator receive an expiration notice from the Training Database 12 months after initial lead medical surveillance. The supervisor and ES&H Coordinator should request a continuation of lead surveillance at that time by submitting a new AMS form to OMC, if warranted by continuing lead exposure. **Note:** In accordance with the OSHA General Industry Lead Standard, blood lead monitoring must be repeated 6 months after initial lead medical surveillance. OMC will schedule this additional testing with the employee.
Step 13	Lead Workers dispose of lead-containing debris (including decontamination clean-up material: vacuum debris and wipe rags) through the Environmental Protection Division (EPD). Waste material will be hazardous waste and must be disposed of according to guidance from the EPD. Follow the Hazardous Waste Management Subject Area before

	generating the waste. If the material is also radioactive, follow the Mixed Waste Management Subject Area before generating the waste. Contact the Waste Management Representative for the Department/Division, or the Hazardous Waste Program Manager, for guidance with the disposal of waste. Label lead-contaminated PPE with the Contaminated PPE Label attached to the exterior of the disposal or laundry shipment bag.

Guidelines

In determining if existing work planning document is adequate and in preparing work planning and control documentation, consider implications and risks related to

- Hazards and exposure limits;
- Storage requirements;
- Disposal requirements;
- Cost (of the chemical itself, implementing requirements, mitigating impacts, disposal);
- Use requirements;
- Controls on use, storage, and disposal;
- Environmental impacts and environmentally regulated chemicals;
- National Environmental Policy Act (NEPA) documentation requirements (see the National Environmental Policy Act (NEPA) and Cultural Resources Evaluations Subject Area);
- Cover horizontal surfaces with heat resistant drop covering to make clean-up of splatter easier.

References

29 CFR 1910.1025, Toxic and Hazardous Substances, Lead

29 CFR 1926.62, Occupational Health and Environmental Controls, Lead

BNL Training and Qualifications website

Facility Hazard Analysis and Risk Assessment Subject Area

Hazardous Waste Management Subject Area

Job Assessment (JAF) & Additional Medical Surveillance Form (AMS), Human Resources Directorate website

Mixed Waste Management Subject Area

National Environmental Policy Act (NEPA) and Cultural Resources Evaluations Subject Area

Recommendations for Personal Protective Equipment (PPE) during work with Lead, ESH Guide: Lead, Safety and Health Services website

Work Planning and Control for Experiments and Operations Subject Area

EXHIBIT: CONTAMINATED PPE LABEL

Management System: ***Worker Safety and Health***

Subject Area: ***Lead***

Contaminated PPE Label

Effective Date:**Jun 10, 2016**

The Contaminated PPE Label is provided as a PDF.

https://sbms.bnl.gov/SBMSearch/subjarea/114/114_Exh2.cfm

Exhibit: Contaminated PPE Label

Labels: Use when labeling bags or containers of contaminated protective clothing and equipment. This label is required where clothing is used in areas above the PEL/TLV.

⚠ DANGER
CLOTHING and EQUIPMENT CONTAMINATED with LEAD
May damage fertility or the unborn child. Causes damage to the central nervous system. Do not eat, drink or smoke when handling. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with applicable local, state, or federal regulations.

EXHIBIT: LEAD SIGN

Management System: ***Worker Safety and Health***

Subject Area: ***Lead***

Lead Sign

Effective Date:**Jun 10, 2016**

The Lead Sign is provided as a PDF.

https://sbms.bnl.gov/SBMSearch/subjarea/114/114_Exh6.cfm

Exhibit: Lead Sign

Signs: Use when posting Regulated Area (areas where OSHA PEL is exceeded).

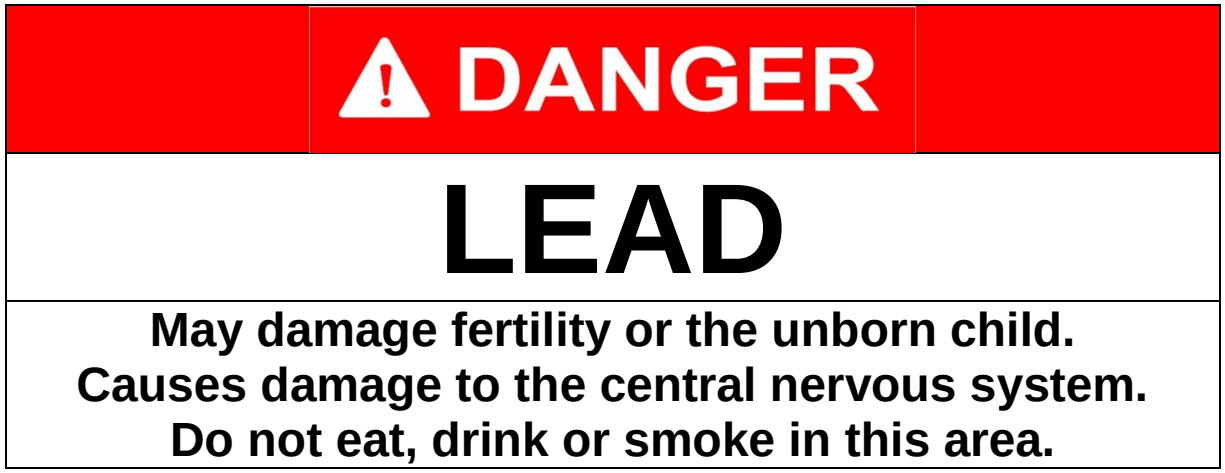

EXHIBIT: RECYCLING & DISPOSAL OF LEAD

Management System: ***Worker Safety and Health***

Subject Area: ***Lead***

Recycling & Disposal of Lead

Effective Date:**Jun 10, 2016**

RECYCLING: Lead should be recycled whenever possible. Acceptable items for recycling include:

- Waste solder from electronics and plumbing, including electronic circuit boards with soldered parts
- Lead bricks and sheets
- Batteries containing lead (such as lead/acid batteries and sealed-gel batteries).

Containers of lead for recycling can be taken to Procurement & Property Management Division (PPM) Division (x4527) at Building 494 to be sent off-site for recycling. Complete a Process Knowledge form with each container/group to verify the radiologic-free status of the lead.

DISPOSAL: If lead wastes can not recycled, then dispose of it via the Environmental Protection Division, Waste Management Program (WM).

- Label the container with a Hazardous Waste Label, include a description of the contents, and keep the container closed except when adding or removing waste. See the Hazardous Waste Management Subject Area for information.
- After filling the container, complete a Nonradioactive Waste Control Form and move the container to the 90-Day Accumulation Area for pick up by Waste Management. See the Hazardous Waste Management Subject Area for information.

Recycle/Disposal Guidelines

Lead Item	Recycle or Disposal	Note or Special Handling
Electronic solder	Recycle via PPM	-
Plumbing solder	Recycle via PPM	-
Lead bricks, sheets, etc. (non-oxidized)	Recycle via PPM	-
Lead bricks, sheets, etc. (oxidized)	Recycle via PPM	Wrap in plastic; paint; or clean surfaces
Lead/Acid Batteries (power supplies, emergency lighting,	Recycle via PPM	Cover contacts with plastic cap or tape

lab/shop/office equipment power sources		
Lead/Acid Batteries (vehicles)	Recycle via Part Vehicle Vendor	Follow vehicle batteries trade-in policy of battery supplier
Lead based paint chips, power blast debris	WM Disposal	-
Contaminated PPE, drop cloths, rags, etc.	WM Disposal	Label bag with Contaminated PPE Label

https://sbms.bnl.gov/SBMSearch/subjarea/114/114_Exh3.cfm

EXHIBIT: REPRODUCTIVE HAZARDS OF LEAD

Management System: ***Worker Safety and Health***

Subject Area: ***Lead***

Reproductive Hazards of Lead

Effective Date:**Jun 10, 2016**

Excerpted from OSHA 1910.1025, Appendix A

Long-term (chronic) overexposure to lead may result in severe damage to 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.

Health protection goals of the standard.

- Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that worker blood lead (PbB) levels be maintained at or below forty micrograms per one hundred grams of whole blood (40 µg/100g).
- The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 µg/100g to minimize adverse reproductive health effects to the parents and to the developing fetus.

Excerpted from *The Effects of Workplace Hazards on Male Reproductive Health* (DHHS NIOSH Publication No. 96-132)

Lead has been identified as reproductive hazards for men. Observed effects:

- Lowered number of sperm: fewer sperm present to fertilize an egg; if no sperm are produced, the man is sterile. If the hazard prevents sperm from being made, sterility is permanent
- Abnormal sperm shape: the shape of sperm cells can be different, making these sperm have trouble swimming or lack the ability to fertilize the egg
- Altered sperm transfer: lead may collect in the epididymis, seminal vesicles, or prostate and may kill the sperm, change the way in which they swim, or attach to the sperm and be carried to the egg or the unborn child

- Altered hormones/sexual performance: Changes in amounts of hormones can affect sexual performance.

Lead can enter the body by inhalation or ingestion (if workers do not properly wash their hands before eating, drinking, or smoking).

Workplace substances that affect male workers may also indirectly cause harm to their families. For example, lead brought home from the workplace on a worker's skin, hair, clothes, shoes, tool box, or car can cause severe lead poisoning among family members and can cause neurobehavioral and growth effects in a fetus.

Excerpted from EPA Technology Transfer Network Lead Compounds: *Hazard Summary* (Created in April 1992; revised in September 2011)

Exposure to lead during pregnancy has been associated with toxic effects on the human fetus, including increased risk of preterm delivery, low birthweight, and impaired mental development, including decreased IQ scores. These effects on mental development have been noted at maternal blood lead levels of 10 to 15 µg/dL and somewhat lower.

Studies on male lead workers have reported severe depression of sperm count and decreased function of the prostate and/or seminal vesicles and suggests an impact on male fertility at blood lead levels of above 40-45 µg/dL.

Human studies are inconclusive regarding the association between lead exposure and other birth defects, while animal studies have shown a relationship between high lead exposure and birth defects.

Excerpted from Lead CAS #7439-92-1 August 2007 CDC Agency for Toxic Substances and Disease Registry
Division of Toxicology and Environmental Medicine ToxFAQs™

In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

Children are more vulnerable to lead poisoning than adults. Children are exposed to lead all through their lives. They can be exposed to lead in the womb if their mothers have lead in their bodies. Babies can swallow lead when they breast feed, or eat other foods, and drink water that contains lead.

FORM: APPLICATION FOR THE USE OF BNL FIREARMS RANGE FOR NON-DOE PURPOSES

Management System: ***Worker Safety and Health***

Subject Area: ***Lead***

Application for the Use of BNL Firearms Range for Non-DOE Purposes

Effective Date:**Jun 10, 2016**

The Application for the Use of BNL Firearms Range for Non-DOE Purposes is provided as a Word file.

https://sbms.bnl.gov/SBMSearch/subjarea/114/114_Exh1.cfm

APPLICATION FOR USE OF BNL FIREARMS RANGE FOR NON-DOE PURPOSES

INSTRUCTIONS TO APPLICANTS

Please submit two (2) copies of this form along with a completed Certification of Liability Insurance to Manager, Safeguards and Security Division, Brookhaven National Laboratory, Upton, New York 11973. Application and certificate must be received two weeks before requested date of use.

Name of Group or Organization:		Telephone Number:
Address (Number and Street)	Town or Village and Zip Code	County

INFORMATION REQUESTED FOR USE OF BNL FIREARMS RANGE

DATE & TIME REQUESTED:	From: Month, Day, Hour (am/pm)	Estimated Attendance:
	To: Month, Day, Hour (am/pm)	

CONDITIONS FOR USE OF BNL FIREARMS RANGE FOR NON-DOE PURPOSES

1. All users of the BNL Firearms Range shall comply with all rules and regulations governing visitors to the Laboratory site, as well as those rules and regulations specifically applicable to the use of firearms at the Range.
2. Users of the BNL Firearms Range must leave such property in good order after use.

The following paragraphs are omitted for agencies of the U.S. Government

3. The applicant agrees to indemnify and hold harmless the Government of the United States and Brookhaven Science Associates, their employees, officers, agents, or any other persons acting on their behalf, against loss or expense, including attorneys' fees, except in cases of the Government's or Brookhaven Science Associates' sole negligence, for damage because of bodily injury including death at any time resulting there from, sustained by any person or persons; or on account of damage to property arising out of or in consequence of the use of property covered by this agreement; whether such injuries to persons or damage to property are due or claimed to be due to any active or passive negligence of the Government of the United States or Brookhaven Science Associates, their employees, officers, agents or any other persons.

Check the Appropriate Box Below

4. ☐ This application shall be accompanied by a certificate of comprehensive general liability insurance with limits of not less than $500,000 per person/$1,000,000 per occurrence for bodily injury, and $100,000 per occurrence for property damage. The Government of the United States and Brookhaven Science Associates must be named as additional insureds for this activity. Failure to do so will result in the disapproval of application.

or

☐ The applicant certifies that it is a self-insurer and that it will indemnify the Government of the United States and Brookhaven Science Associates in accordance with paragraph 3.

CERTIFICATION OF APPLICANT

We, as duly authorized representatives of the group or organization named in this application, have read and agree to abide by the above conditions.

Signature of Applicant	Telephone	Signature of Presiding Officer of Group/Org
Printed Name and Address of Applicant		Printed Name and Title of Presiding Officer

FORM: OUTSIDE AGENCY USER STATEMENT

Management System: ***Worker Safety and Health***

Subject Area: ***Lead***

Outside Agency User Statement

Effective Date:**Jun 10, 2016**

The Outside Agency User Statement is provided as a Word file.

The only official copy of this file is the one on-line in SBMS.

Before using a printed copy, verify that it is the most current version by checking the *effective date*.

Questions/Comments Disclaimer

https://sbms.bnl.gov/SBMSearch/subjarea/114/114_Exh7.cfm

BROOKHAVEN NATIONAL LABORATORY

SAFEGUARDS AND SECURITY DIVISION

POLICE GROUP

OUTSIDE AGENCY USER STATEMENT

"Range Instructors of Federal and local groups shall be provided with a copy of the Range Regulations and be required to sign a statement that the regulations are understood and will be followed before permission to use the Live Fire Range is given."

I _____ have received, read, and understand the Brookhaven National Laboratory Live Fire Range regulations.

Signature_____ **Date_____**

DEFINITIONS

Definition: Lead

Term	Definition
action level	Airborne concentration of lead particulate specified by OSHA (30 ug/m3) to serve as an indicator of the need to perform an action that may include (depending on specific circumstances) training, medical surveillance, and exposure monitoring.
BNL contracting organization	Any BNL organization that enters into an agreement with a non-BNL company or organization to perform work at BNL when the work will involve or disturb lead, cause potential worker or environmental exposure to lead above exposure limits, or in any other way trigger an action stated in this subject area.
controls	Activities that lessen the ability to generate dusts, such as wetting a surface before scraping.
exposure limit	Airborne concentration of lead particulate exceeding the lower of the published concentration of the OSHA Permissible Exposure Limit or the ACGIH Threshold Limit Value®. The exposure limit represents the highest airborne concentration to which an employee may be exposed without engineering controls, administrative controls, respiratory protection, and full medical surveillance.
Laboratory scale	Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.
lead	Elemental Lead, all inorganic lead compounds, and organic lead soaps. (No lower limit in OSHA.)
Lead Worker	Anyone with the actual or potential for exposure to lead. Exceptions include personnel using/operating firearms, laboratory-scale use, and drinking water exposure.
lead-based paint (LBP)	Protective coating applied to wood, metal, concrete or other substrate that contains measurable lead by XRF exceeding 1 mg/cm2 or AA/ICP analysis exceeding 5000 mg/kg (0.5%).
worker protection	Use of HEPA-filtered or supplied air respirator, protective clothing, baseline lead medical exams and periodic surveillance, and lead hazard awareness training.