

LEAD HAZARD MANAGEMENT PLAN

APPENDIX A

STANDARD LIMITS OF LEAD CONCENTRATION IN MATRICES

Matrix		Concentration	Agency	Application	Basis
Paint	paint <i>XRF</i>	>1.0 mg/cm ²	EPA	Dried Film - LBP (Abatement)	Technology
	paint chip <i>(lab analysis)</i>	>5000 ppm (µg/g) (>0.5% by weight)	HUD EPA	Dried Film – LBP (Abatement)	Technology
	Non-LBP	<600 ppm (µg/g) (0.6% by weight)	CPSC	Liquid Form – Lead Free (For residential application)	Impurity Level
Dust		<40 µg/ft ²	EPA	Uncarpeted floor - Risk assessment and Clearance	Health
		<250 µg/ft ²	EPA	Window Stool (Sill) – Risk assessment and Clearance	Health
		<400 µg/ft ²	EPA	Window Trough (well) Risk assessment and Clearance	Health
Bare Residential Soil		400 ppm (where there is child contact such as play area)	EPA HUD	Public Notice. Interim controls Action: Take measures to eliminate contact - change use patterns and provide barriers for children	Health
		1,200 ppm (with minimal or no child contact such as drip line)	EPA HUD	Action: Interim control measures to cover soil or eliminate contact	Health
<i>RCRA waste</i>		≥5 ppm Leachable lead (TCLP)	DHEC HUD	Hazardous Waste characterization	Environment
<i>Blood</i>		10 ug/dl	CDC	Level of concern for children	Health
		40 ug/dl	OSHA	Worker return to work level	Health
		50 ug/dl	OSHA	Worker medical removal level	Health
<i>Water</i>		0 ppb (ug/l)	EPA	Maximum Contaminant Level Goal (MCLG)	Health
		15 ppb (ug/l)	EPA	Public Notice	Health
<i>Potable Water</i>		0.2%	EPA	Solder	Health
		8.0%	EPA	Pipes and Fixtures	Technology

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Air	1.5 ug/m ³	EPA	Quarterly TWA	Air Quality
	30 ug/m ³	OSHA	Action Level (8 hr TWA)	Health
	50 ug/m ³	OSHA	PEL (8 hr TWA)	Health
<i>Ceramic or Pottery Glasses</i>	3ppm	FDA	Flatware	Health
	2ppm	FDA	Small Hollow-ware	Health
	1ppm	FDA	Large Hollow-ware	Health
	0ppm	FDA	Cups, Mugs, and Pitchers	Health

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APPENDIX B

AIR LEAD LEVELS AND RESPONSE ACTIONS

The following are a summary table of specific air lead levels and the actions to be taken IAW 29 CFR 1926.62; and a schematic of requirements of the OSHA lead standard.

Regardless of Level	For Specific Air Lead Levels			During Assessment of Trigger Tasks	
	\geq Action Level (30 ug/m ³)		> PEL (50 ug/m ³)		
	1-30 days	> 30 days	> 4xPEL		
<ul style="list-style-type: none"> - Exposure assessment & interim protection. - Good Housekeeping. - Wash hands after performing work in facilities. - Hazcom training and/or safety training and education. 	<ul style="list-style-type: none"> - Monitoring representative of exposure for each exposed employee. - Initial medical surveillance. - Follow-up blood sampling. - Temporary removal due to elevated blood lead. - Information and training. 	<ul style="list-style-type: none"> - Medical surveillance program. - Medical exams and consultation (if required). 	<ul style="list-style-type: none"> - Work practice & engineering controls. - Respiratory protection. - Protective clothing & equipment. - Hygiene facilities and practices. - Post OSHA warning signs. 	<ul style="list-style-type: none"> - Clean & replace protective clothing daily. 	<ul style="list-style-type: none"> - Appropriate respiratory protection. - Protective clothing and equipment. - Change areas. - Hand washing facilities. - Biological monitoring. - Hazcom training - Respirator training - Safety training & education.

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APPENDIX C

CONTROLLING LEAD PAINT ON PUBLIC PLAYGROUND EQUIPMENT

C-1. GENERAL

The U.S. Consumer Product Safety Commission (CPSC) findings indicate a potential lead paint poisoning hazard for young children (6 years and younger) from some public playground equipment. The equipment was painted with lead paint, and over time, the paint has deteriorated into chips and dust containing lead, due to exposure to sunlight, heat, moisture, and normal wear and tear. The lead paint chips and lead dust can be ingested by young children who put their hands on the equipment while playing, and then put their hands in their mouths.

C-2. LEAD HAZARD ASSESSMENT

A lead hazard assessment for playground equipment includes a visual inspection, examination of records, paint testing, characterization of the hazard, identification of potential control measures, and a plan for establishing the priority for the implementation of control measures.

- a. Visual Inspection: This inspection will be coordinated with regular safety inspection. Playground equipment will be inspected and regularly maintained to ensure that it meets safety guidelines and provides a safe environment for children, regardless of whether it contains lead paint.
- b. Lead testing: If at any time, the painted surface begins to deteriorate, paint will be tested for lead. Priority will be given to testing deteriorating paint from playground equipment that has been painted or repainted before 1978. The amount of lead in the paint is one important factor in deciding whether control measures are needed. If the visual inspection indicates the need for significant structural repairs or changes to the equipment that are likely to affect the integrity and condition of the painted surfaces (i.e., will result in peeling, cracking, chipping, chalking), the paint will be tested to determine if it contains lead before any repair work begins.
- c. Evaluation: If lead testing shows above the EPA's limit and the paint are deteriorated, the extent of the hazard will be characterized and control measures undertaken. Control measures for lead paint below the EPA's limit is to be considered, however, priority will be given to implementing control measures for deteriorating paint above the limit.

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C-3. HAZARD CONTROL MEASURES

a. Lead hazard controls:

- (1) Just knowing that a playground has paint containing lead may not indicate if there is a hazard. CPSC does not consider playground equipment with LBP that is intact and in good condition to be a hazard. Therefore, continued monitoring (visual inspection) is essential, and may be an appropriate control measure for intact paint containing lead.
- (2) Over time, paint will deteriorate due to exposure to changing weather conditions and normal wear and tear. If that paint contains lead, it does present a hazard once it deteriorates, and requires attention.
- (3) Priority will be given to controlling deteriorating LBP on public playground equipment containing lead in amounts above the MDE's limit. Because playground equipment is intended for use by children, consideration of measures that permanently eliminate the potential hazard posed by lead paint are recommended. In general, interim control measures for playground equipment may be considered appropriate if the playground is slated for repair or the equipment is expected to be replaced within a few years. In some cases, permanent control measures may be more cost-effective over the long-term than interim control measures when the cost of monitoring is considered.

b. Interim Control Measures

- (1) Stabilize and cover the lead paint surface with nonleaded paint or an encapsulant. This will only temporarily reduce lead exposure because outdoor metal and wood playground equipment is continually subject to deterioration due to exposure to sunlight, heat, moisture, and wear and tear through normal play activities.
- (2) Playground equipment that has been covered with an encapsulant or nonleaded paint requires regular monitoring (visual inspection) throughout the life of the equipment. Such monitoring would allow detection if the surface does not remain in good condition throughout changing weather conditions and wears due to normal play activities.

c. Permanent Control Measures

- (1) Replace the playground equipment: Replacing playground equipment or component parts that contain lead paint is the most definitive way to eliminate the risk of lead poisoning from exposure to lead paint on playground equipment.
- (2) Remove lead paint: Removal of LBP will be performed by a lead paint removal professional who is trained, certified, or licensed to remove lead hazards. Removing lead paint improperly can increase the hazard by spreading lead chips and dust around the play area. Surfaces should be repainted with paint containing no more than 0.06% lead, according to CPSC regulations.

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APPENDIX D

LEAD-BASED PAINT IN HISTORIC HOUSINGS/BUILDINGS

D-1 GENERAL

- a. Lead in Historic Paints: Lead compounds were an important component of many historic paints. Lead in the forms of lead carbonate and lead oxides had excellent adhesion, drying, and covering abilities. White lead, linseed oil, and inorganic pigments were the basic components for paint in the 18th, 19th, and early 20th centuries. The premise of this chapter is that historic housing can be made lead-safe for children without removing significant decorative features and finishes, or architectural trim work that may contribute to the building's historic character.
- b. Fort Jackson, historical, has facilities and structures that are more than 50 years of age, and are could be eligible for listing in the National Register of Historic Places. The Fort Jackson Cultural Resource Management Plan provides direction for preservation planning activities within the practical context of the installation's operation and mission. The DPW Environmental Management Branch will be consulted for any plans of historic building's renovation project to ensure compliance with Federal and State historic preservation laws and regulations.

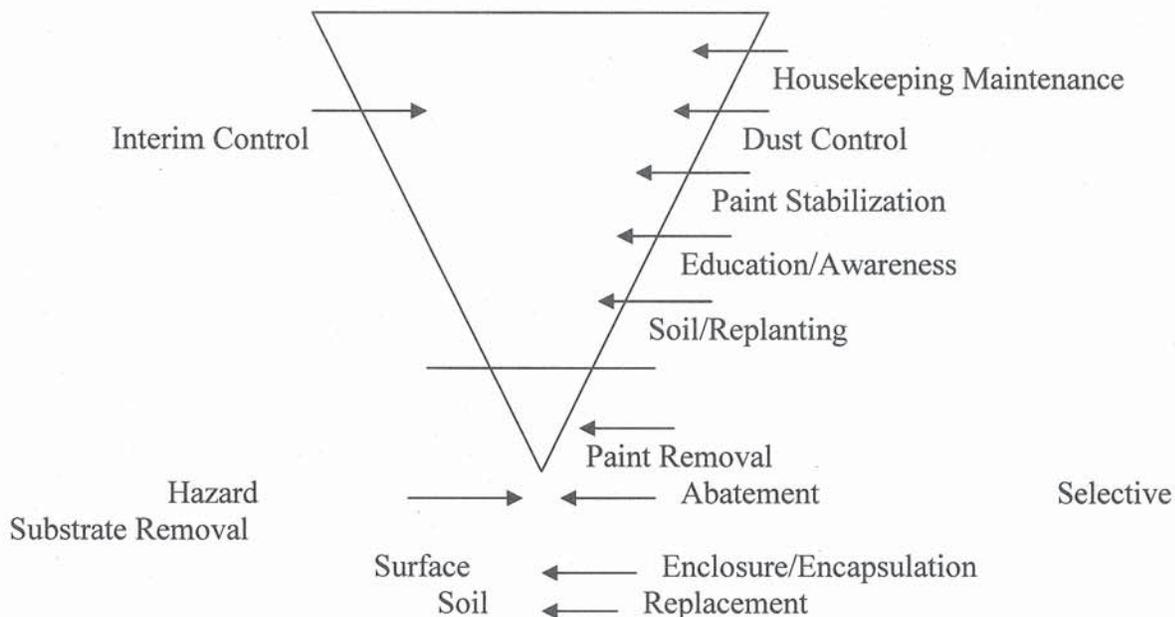
D-2 MANAGEMENT PROCEDURES

- a. It is important that owners of historic properties be aware that layers of older paint can reveal a great deal about the history of a building and that paint chronology is often used to date alterations or to document decorative period colors. Highly significant decorative finishes, such as graining, marbling, stenciling, polychrome decoration, and murals should be evaluated by a painting conservator to develop the appropriate preservation treatment that will stabilize the paint and eliminate the need to remove it.
- b. If such finishes must be removed in the process of controlling lead hazards, then research, paint analysis, and documentation are advisable as a record for future research and treatment.
- c. Planning for Lead Hazard Reduction in Historic Buildings: Removing LBP could result in extensive loss or modification of architectural features and finishes and is not appropriate for most historic properties. A preferred approach, consistent with "The Secretary of the Interior's Standards for the Treatment of Historic Properties", calls for removing, controlling, or managing the hazards rather than wholesale or even partial removal of the historic features and finishes. This is generally achieved through careful cleaning and treatment of deteriorating paint, friction surfaces, surfaces accessible to young children, and lead in soil. LBP that does not cause a hazard is thus permitted to remain, and, in consequence, the amount of historic finishes, features, and trim work removed from a property is minimized.

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- d. Process: The following is three-step planning process which provides owners and managers of historic housing with responsible methods for protecting historic paint layers and architectural elements, such as windows, trim work, and decorative finishes. Exposed decorative finishes, such as painted murals or grained doors can be stabilized by a paint conservator without destroying their significance.
- (1) Identify the historical significance of the building and architectural character of its features and finishes.
 - (2) Undertake a risk assessment of interior and exterior surfaces to determine the hazards from lead and LBP.
 - (3) Evaluate the options for lead hazard control in the context of historic preservation standards.
- e. Appropriate Methods for Reducing Lead-Paint Hazards in Historic Buildings: Reducing and controlling lead hazards can be successfully accomplished without destroying the character-defining features and finishes of historic buildings. Federal laws generally support the reasonable control of LBP hazards through a variety of treatments, ranging from modified maintenance to selective substrate removal. The key to protecting children, workers, and the environment is to be informed about the hazards of lead, to control exposure to lead dust and lead in soil, and to follow existing regulations. In all cases, methods that control lead hazards should be selected that minimize the impact to historic resources while ensuring that housing is lead-safe for children.

Managing Lead in Historic Housing



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(1) Interim solutions, the preferred approach, include a combination of the following:

General Maintenance	Dust Control	Paint Stabilization	Soil Treatment	Occupant Education
<p>Repair deteriorated materials;</p> <p>Control leaks;</p> <p>Maintain exterior roofs, siding, etc. to keep moisture out of building;</p> <p>Perform emergency repairs quickly if LBP is exposed;</p> <p>Maintain building file with lead test data and reports on completed lead mitigation work.</p>	<p>Damp mop floor; wet broom sweep porches and steps;</p> <p>Damp dust window sill and window wells;</p> <p>Wash down painted surfaces periodically (use tri-sodium phosphate or equivalent, if necessary);</p> <p>Clean or vacuum carpets regularly (use HEPA vacuum if lead dust returns);</p> <p>Undertake periodic inspection with dust wipe tests if necessary.</p>	<p>Wet-sand loose paint and repaint;</p> <p>Keep topcoats of paint in good condition;</p> <p>Selectively remove paint from friction & chewable surfaces (sills) and repaint;</p> <p>Use good quality latex, latex acrylic or oil/alkyd paints compatible with existing paint;</p> <p>Consider more durable encapsulating paints and wall lining systems if necessary.</p>	<p>Add bark mulch, sod or topsoil to bare dirt areas with high lead levels;</p> <p>Discourage children from playing in these areas by providing sand box or other safe areas;</p> <p>Do not plant vegetable garden in areas with lead in soil;</p> <p>Be careful that pets do not track contaminated soil inside house.</p>	<p>Notify occupants and workers as to the location of LBP;</p> <p>Instruct tenants to keep property clean;</p> <p>Occupants shall be provided with available lead data for their facility and shall be encouraged to report cracked, peeling LBP as it occurs/ when repairs are necessary;</p> <p>Provide occupants with the EPA pamphlets on the hazards of LBP.</p>

(2) Hazard abatement removes the hazard – not necessarily all the paint or the feature, and may include:

Paint Removal	Paint Encapsulation Enclosure	Replace Deteriorated Elements	Soil Treatment	Compliance

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<p>Remove deteriorated paint or paint on friction, chewable, or impact surfaces to sound layer, repaint;</p> <p>Consider using the gentlest means possible to remove paint to avoid damage to substrate: wet sanding, low level heat guns, chemical strippers, or HEPA sanding;</p> <p>Send easily removable items (shutters, doors) off-site for paint stripping, then reinstall and paint.</p>	<p>Consider encapsulating liquid (encapsulant) with 20 years warranty to seal-in older paint; or use in combination with wall liners to stabilize plaster wall surfaces prior to repainting;</p> <p>Seal LBP surfaces behind rigid enclosures, such as drywall, or use plywood with new coverings over previously painted floors;</p> <p>Use rubber stair treads on painted steps.</p>	<p>Remove, only when necessary, seriously deteriorated painted elements such as windows, doors, and trimwork. Replace with new elements that match the historic in appearance, detailing, and materials, when possible;</p> <p>Replace component element of a friction surface (parting bead or stops of windows) or of impact surfaces (shoe moldings) with new elements.</p>	<p>Remove (if necessary) contaminated soil around foundation to a depth of 3" and replace with new soil and appropriate planting material or paving;</p> <p>Do not alter a significant historic landscape.</p>	<p>Be aware of all federal, state and local laws regarding LBP abatement, environmental controls and worker safety;</p> <p>Dispose of all hazardous waste according to applicable laws;</p> <p>Be aware that methods to remove LBP can cause deferring amounts of lead dust that can be dangerous to workers and residents.</p>
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The above mentioned chart indicates the wide variety of treatments that can be used to control or eliminate LBP hazards. For historic buildings, the least invasive method should be used to control the hazards identified during a risk assessment. The more invasive hazard control methods that must be carefully implemented to ensure that whenever possible, historic materials are protected.

D-3 IMPACT ON HISTORIC MATERIALS

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The following chart shows how the lead hazard control works can impact on historic materials in a property.

IMPACT OF VARIOUS PAINT REMOVAL/ABATEMENT TECHNIQUES

Removal Method	Impact on Materials	Lead Dust Generated	Impact on Environment
Wet scraping; wet sanding; repainting	Low: Gentle to substrate; feather edges to obtain smooth paint surface	Low: Misting surfaces reduces lead dust	Low-medium: LBP debris is hazardous waste (HW); disposed properly.
Heat gun; paint removal with scrapers	Low: Gentle to substrate	Medium: Flicking softened paint does create airborne lead dust.	Medium: Lead-paint sludge is hazardous waste.
Chemical stripping on-site; use liquid or poultice; avoid methylene chloride	Low to Medium: Avoid damage to wood texture/grain with long dwell time	Low: Chemicals are moist and reduce lead dust.	Medium: Lead residue hazardous; off/rinse must be filtered or contained.
Controlled HEPA sanding; primarily for wooden surfaces; sander uses HEPA vacuum shroud	Low to Medium: Avoid gouging wooden surfaces; good for feathering edges	Medium to High: Worker must know how to use equipment.	Medium to High: Paint debris is hazardous and must be contained in drums and disposed properly.
Dry abrasives on cast iron; CO ₂ , walnut shells, needle gun removal; can use vacuum shrouds	Low to Medium: Substrate must be durable and in good condition; not for soft or porous materials.	Generally High: Large volume of paint chips fall freely unless there is a vacuum shroud.	Medium to High: Increased volume of hazardous waste if abrasive is added to lead debris.
Chemical stripping off-site; cold tank reduces ungluing caused by hot tank	Medium to High: Elements can be damaged during removal or in tank.	Usually low: Take care when removing elements to minimize lead-laden dust.	Low to Medium: Stripping contractor responsible for disposal.
Feature or substrate removal and replacement	High: Loss of feature is irretrievable; avoid wholesale removal of significant elements.	Usually low: Worker exposure can be high if element hazardous due to high amounts of LBP.	Varies: Must do a TCLP leach test to determine the classification of waste whether non-HW or HW

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APPENDIX E

PERSONAL PROTECTIVE EQUIPMENT

E-1 GENERAL

Exposure to lead from LBP can occur in the occupational setting as well as in the “human environment”. It is particularly important that employees utilize the proper personal protective equipment (PPE) when performing tasks that may involve lead exposure. This includes any LBP activities such as removing LBP from buildings and other structures, LBP abatement work, LBP inspection, general construction, renovation and demolition operations. To avoid exposure, employees must comply with appropriate laws, regulations, and policies.

E-2 RESPIRATORY PROGRAM REQUIREMENTS - LEAD (29 CFR 1910.134)

Dust generated from deterioration, destruction or removal of LBP represents an important health hazard. Employees may become exposed to lead dust by inhalation. Subsequently, the use of approved respirators is required.

a. PROGRAM ELEMENTS: Respiratory program elements are as follow:

- (1) Procedures for selecting respirators for use in the workplace.
- (2) Medical evaluations of employees required using respirators.
- (3) Fit testing procedures for tight-fitting respirators.
- (4) Procedures for proper use in routine and reasonably foreseeable emergency situations.
- (5) Procedures for the cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.
- (6) Procedures to ensure air quality, quantity, and flow of breathing air for atmosphere-supplying respirators.
- (7) Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations.
- (8) Training of employees in the proper use of respirators, including putting on and removing them, any limitations on use, and their maintenance.
- (9) Procedures for regularly evaluating the effectiveness of the program.

b. POLICY:

- (1) Appropriate respirators are used when lead dust is present at the work site. Generally, an air-purifying respirator with appropriate filter cartridges is used. However, supervisors must consider all factors associated with the work site to preclude other hazards. Other chemical hazards or oxygen-deficient environments may exist that require airline or self-contained breathing apparatus (SCBA) respirators.

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Lead Abatement Respirator Requirements (29 CFR 1926.62)

<i>Task</i>	Presumed Exposure	<i>Mask</i>
Manual demolition, manual sanding, manual scraping, heat gun, power tool cleaning with dust collection systems, spray painting LBP	50 – 500 μ/m^3	Half-mask Respirator
Lead containing mortar, lead burning, rivet busting LBP material, power tool cleaning without dust collection systems, abrasive blast enclosure movement and cleanup	500 – 2500 μ/m^3	Full-face Respirator or PAPR
Abrasive blasting, torching, cutting, welding	>2500 μ/m^3	Supplied Air Respirator

- (2) Only National Institute for Occupational Safety and Health (NIOSH)-approved respirators are used.
- (3) Personnel will not perform tasks that require use of a respirator unless such personnel have had medical clearance, respirator training, fit testing and proper respirators have been provided.
- (4) The employer shall ensure that an employee using a tight-fitting face piece respirator is fit tested prior to initial use of the respirator, whenever a different respirator face piece (size, style, model or make) is used, and at least **annually** thereafter.

E-3 PERSONAL PROTECTIVE CLOTHING AND OTHER EQUIPMENT

- a. The type of work environment that may contain LBP hazards is variable. Proper safe work attire must be worn based on the work site conditions. Regardless of the work site conditions, employees should take all precautions against contaminating street clothes and foot wear with dust and debris suspected or known to contain lead. If such contamination occurs, it is likely that lead will be carried to other work sites or home where other people can be exposed.
- b. In addition to wearing approved respirators, employees with potential for exposure to LBP hazards should also wear protective clothing, such as disposable protective outer garments. Additionally, other work site factors should be considered. Eye protection such as goggles is necessary to avoid dust contact with the eyes. Proper foot wear and disposable gloves are also required. Other items such as hard hats are recommended.
- c. The following actions are required under the OSHA Lead in Construction Standard by Exposure Level.

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30 $\mu\text{g}/\text{m}^3$ and below	30 – 50 $\mu\text{g}/\text{m}^3$	Over 50 $\mu\text{g}/\text{m}^3$
<ul style="list-style-type: none"> • Train employees • Conduct exposure monitoring • Maintain records 	<ul style="list-style-type: none"> • Provide respirator at employee request • Conduct exposure monitoring every 6 months • Conduct blood lead monitoring • Provide protective clothing in a clean and dry condition at least weekly. 	<ul style="list-style-type: none"> • Enforce respirator use • Provide protective clothing in a clean and dry condition daily and enforce for usage. • Conduct exposure monitoring every 3 months • Enforce housekeeping • Provide hygiene facilities (change areas, showers, eating facilities & hand washing facilities); and enforce washing

- d. Supervisors must still consider all characteristics of the work site to ensure that employees are protected against other hazards besides lead.

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LBP ANNUAL PLAN REVIEW

The Revised FJ Lead Hazard Management Plan must be submitted under a staff summary sheet, to organizations with LBP management responsibilities for review and comment when applicable. Organizations are to forward all comments and required changes to EMB, the Office of Primary Responsibility (OPR). The table below summarizes comments received by EMB for the current revision of the plan.

Reviewed By	Organization	Date Reviewed	Revision Level	Remarks

Table 2: LBP Annual Plan Review Log

LBP PLAN UPDATE & REVISION

Revisions reflect significant changes to the plan. Revisions can include format changes or changes due to significant revisions of policies, operations and/or regulations. A revised plan must be submitted to each organization responsible for LBP management and signed by the Garrison Commander. An update reflects minor changes that are not a result of operational and/or regulatory changes or significant changes to the plan's format. For example, updates include a Point-of-Contact (POC) name change, or addition of annual metrics data. An update does not require review by any organizations other than EMB. This plan shall be reviewed annually and revised at least every three (3) years, if needed.

Reviewed By	Organization	Date Reviewed	Revision Level	Remarks

Table 3: LBP Plan Update & Revision Log

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