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Cc: DiBartolomeis, Michael (CDPH-OHB)
Subject: 128 - Firing Ranges Alert
Attachments: OLPPP Comments- NIOSH Pb firing range document 6-30-08.doc

June 30, 2008

NIOSH Docket Office
Robert A. Taft Laboratories
4676 Columbia Parkway, Mailstop C-34
Cincinnati, Ohio 45226

NIOSH Docket Number 128

SUBJECT: Comments on the Draft Document: "Preventing Occupational Exposures to Lead and N

The Occupational Lead Poisoning Prevention Program (OLPPP) of the California Department of Pu

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SUBJECT: Comments on the Draft Document: "Preventing Occupational Exposures to Lead and Noise at Indoor Firing Ranges"

To Whom It May Concern:

Thank you for the opportunity to comment. The Occupational Lead Poisoning Prevention Program (OLPPP) of the California Department of Public Health is submitting the following comments on the draft document entitled "Preventing Occupational Exposures to Lead and Noise at Indoor Firing Ranges," prepared by the National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC).

This education and outreach document contains important information about health and safety issues related to owning, operating, working at, and patronizing both indoor and outdoor firing ranges. In April 2006, OLPPP staff submitted comments on an earlier draft of this document and we are pleased to see that many of our comments have been incorporated into this latest draft. Our comments on this latest draft are organized into: A) general comments and B) specific comments on the text of the document. If you have any question about our comments, please contact Michael J. DiBartolomeis, PhD, DABT, Chief, OLPPP, at (510) 620-5757 or mdibarto@cdph.ca.gov.

A) General Comments

1. The draft document refers to the 2007 summary of recent scientific literature on exposures to and health effects of lead prepared by the Association of Occupational and Environmental Clinics (AOEC). In addition to this information, we highly recommend that NIOSH also summarize the findings published by Kosnett M. et al., "Recommendations for Medical Management of Adult Lead Exposure," *Environmental Health Perspect.*, 115(3):463-471, 2007 (http://www.ehponline.org/members/2006/9784/9784.html). OLPPP prefers the EHP article because we believe its guidance is more health protective for some exposures and vulnerable populations. We provide some suggested language to add to the document in our specific comments below.

2. NIOSH should recommend switching to lead-free ammunition (bullet and primer) in the one-page recommendations to the employer/operator. At the very least, ranges should permit only fully jacketed ammunition to minimize lead exposures on the range. In our specific comments on the text, we suggest some added language for the recommendations for employers and firing range operators in the draft document.

3. The document would be improved by including a description of and providing information on newer designed backstops and traps. Some of the newer backstops (shredded rubber tires encased in a net) can help reduce lead bullet fragmentation, lower noise levels, and reduce hazardous waste clean-up for the workers. For example, "Super Trap" (http://www.supertrap.com/ST_Products.htm) is one of the better known products available. OLPPP does not endorse any specific product; we only include this link for reference.

B) Specific Comments on the Text of the Document

In the following comments, OLPPP has copied portions of text from the original draft document and suggested changed to the text. Additions are shown as underlined text in red print and deletions are shown with a single strike though.

(The following excerpt is from the Worker 'one-pager' at the front of the NIOSH document.)

Workers should take the following steps to protect themselves from exposure to hazardous lead concentrations and noise levels at indoor firing ranges:

4. Know and report symptoms.

- Common symptoms of lead poisoning in adults include nausea, diarrhea, vomiting, poor appetite, weight loss, anemia, excess lethargy or hyperactivity, headaches, abdominal pain, and kidney problems.
- If you suspect you may have been exposed to lead, even if you have no symptoms, ask about having a blood lead level test done.
- Exposure to high levels of noise can lead to hearing loss, tinnitus (ringing in the ear), stress, anxiety, high blood pressure, gastro-intestinal problems, and chronic fatigue.
- Report any of these symptoms to your employer or range operator.
- Seek medical attention when appropriate.

(The following excerpts are from the Employer 'one-pager' at the front of the NIOSH document.)

Employers and firing range operators should take the following steps to protect their workers and shooters from exposure to hazardous lead concentrations and noise levels at indoor firing ranges:

1. Provide workers and shooters with information about hazards and appropriate training to prevent hazardous exposures.

- Provide general information and specific hazard warnings through workplace postings and targeted training programs.
- State the precautions and hygiene practices required of the firing range workers and shooters.

- Train workers and shooters on the actions and means available to eliminate or limit potential exposures.
- Inform workers and shooters about symptoms that may indicate a health problem. Also inform workers that elevated lead levels can occur without overt symptoms and that a blood lead level test should be done if there is concern about an exposure to lead.
- Inform workers and shooters that levels of lead once thought safe are now known to be harmful. Advise that blood lead levels be kept below 10 micrograms of lead per deciliter (µg/dL) of blood.
- Inform pregnant workers and shooters, or those considering pregnancy, about the possible adverse health effects to the fetus as well as the increased chance of miscarriage at blood lead levels > 5 µg/dL.

4. Provide workers with health and medical monitoring.

- Provide workers with initial and periodic medical monitoring as required by the OSHA lead standard (29 CFR 1910.25(d)).
- Best medical management practices, from organizations such as the Association of Occupational and Environmental Clinics or those provided in the journal *Environmental Health Perspectives* (March 2007)[1] should be ~~considered~~ recommended for all lead-exposed adults (workers and shooters).
- Provide workers with audiometric evaluations as required by OSHA noise standard (29 CFR 1910.95(d)(e)(g)(h)).

5. Allow only lead-free bullets and primers or fully jacketed ammunition with lead-free primers on the firing range.

1. Michael Kosnett, Richard Wedeen, Stephen Rothenberg, Karen Hipkins, Barbara Materna, Brian Schwartz, Howard Hu, Alan Woolf. Recommendations for Medical Management of Adult Lead Exposure. *Environmental Health Perspect*, 115(3):463-471, 2007. http://www.ehponline.org/members/2006/9784/9784.html

(The following excerpt is from page 1 of the NIOSH document.)

BACKGROUND

The Bureau of Justice Statistics estimates that 105,000 Federal law enforcement officers and more than 1 million State and local police officers are employed in the United States [DOJ 2004]. These officers are required to train regularly in the accurate and proficient use of firearms. Indoor firing ranges have gained wide appeal among law enforcement agencies because they offer protection from inclement weather conditions and can be operated around the clock under controlled environmental conditions. The National Shooting Sports Foundation estimates that there are 17 million active target shooters in the United States. Of those, 13.8 million are rifle shooters and 10.7 million participate in handgun target shooting [NSSF 2006]. NIOSH estimates that 16,000 to 18,000 firing ranges operate in the

United States. Most are small operations and are often family-run. Many are operated without the benefit of sufficient environmental and occupational health controls in place to effectively protect the health of shooters and firing range personnel from the adverse effects of exposure to lead, noise, and other contaminants. The hazards from exposure to lead (~~both~~ airborne, ingestion, and skin), noise, and other contaminants at indoor firing ranges have been widely investigated [Valway et al. 1989; Novotny et al. 1987; Price 1989]. Some of these investigations have documented elevated blood lead levels and hearing loss—particularly among employees and instructors.

During the last 2 decades, NIOSH has performed numerous Health Hazard Evaluations (HHEs) of indoor firing ranges and documented the hazards of exposure to lead and noise among firing range operators, workers, and shooters. In 1975, NIOSH published a technical document titled *Lead Exposure and Design Considerations for Indoor Firing Ranges* to provide recommendations for reducing or eliminating hazards associated with indoor firing ranges [NIOSH 1975]. This Alert highlights the issues inherent in operating such facilities and addresses advances in exposure assessment methods, control technologies, and new regulations and exposure guidelines.

(The following excerpt is from page 2 of the NIOSH document.)

CURRENT REGULATIONS, RECOMMENDATIONS, AND OTHER GUIDELINES

The primary sources of exposure standards and guidelines for the U.S. workplace are the Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs) (29 CFR· 1910) and the NIOSH recommended exposure limits (RELs) [NIOSH 1992a]. Most employers are mandated to follow the OSHA standards; however, employers are encouraged to follow the most protective criteria. This is especially true for the OSHA lead standards which are based on medical information on lead that was available in the 1970's.

OSHA Regulations

(Note: The OSHA lead standards are based on medical information that was available in the 1970's. While once thought to be protective, it is now known that the adverse health effects of lead occur at much lower levels. Current recommendations are that adult blood lead levels be kept below 10 µg/dL and that pregnant women or women considering pregnancy not have a blood lead level above 5 µg/dL.)

The Federal OSHA General Industry Lead Standard (29 CFR 1910.1025) establishes specific airborne lead exposure levels for employees working in areas where airborne lead is present. Lead exposure is determined through air sampling that measures the concentration of lead in the air (the number of micrograms of lead present in a cubic meter of air). The standard creates two levels of exposure, the action level (AL) and the PEL. The action level for airborne lead exposure is 30 micrograms per cubic meter (µg/m3) of air as

an 8-hour time-weighted average (TWA). If it is determined that airborne lead concentrations exceed the action level for more than 30 days per year, an employer must provide a medical surveillance program to the worker consisting of biological monitoring and medical examinations and consultations. Should a worker's average blood lead level (BLL) meet or exceed 50 micrograms of lead per deciliter (μg/dL) of blood, the employer is required to temporarily remove the worker from the work area. The OSHA standard does provide for economic protection for such medically removed workers. Medically removed workers cannot return to jobs involving lead exposure until their BLLs are below 40 μg/dL. Benefits must be provided during the period of temporary medical removal—i.e., the employee continues to receive the same earnings, seniority, and other rights and benefits he or she would have had if they had not been removed. The OSHA PEL for airborne exposure to lead is 50 μg/m3 as an 8-hour TWA. The PEL is reduced for shifts greater than 8 hours using the formula:

maximum PEL in μg/m3 = 400 / hours worked per day

If airborne lead levels exceed the PEL for more than 30 days per year, then an employer is required to implement additional monitoring and management activities.

Currently, 24 States and 2 territories administer and enforce their own occupational safety and health programs. A list of these "State Plan States" can be obtained by contacting the appropriate authority in the State where the firing range is operated or through the OSHA Web site at *www.osha.gov*. It is important to note that State Plans must be at least as protective as the Federal OSHA standards.
**Code of Federal Regulations*. See CFR in references.

(The following excerpt is from page 3 of the NIOSH document.)

NIOSH Recommendations
The NIOSH REL for airborne lead is 50 μg/m3 as an 8-hr TWA; airborne concentrations should be maintained so that a worker's BLL remains below 60 μg lead/100 g of whole blood [NIOSH 1992a].

In addition to inhalation exposures, lead from contaminated surfaces and from firearms discharge can be transferred to people's skin, especially the hands. Lead-contaminated hands can contribute to ingestion while handling food, beverages, and other items that contact the mouth. ~~Skin exposures often result from hidden hazards that are not anticipated or recognized, and hence are inadequately controlled. Controlling lead-contaminated surfaces (and skin contamination) is highly dependent on anticipation and identification of lead contamination on surfaces; strict attention and adherence to personal hygiene practices; and appropriate administrative controls (e.g., hazard communication).~~ To avoid ingesting lead, it is necessary to recognize that surfaces in the range are likely to be highly contaminated with lead and to clean them regularly. Currently, there are no Federal occupational exposure limits for lead contamination of surfaces. However, NIOSH researchers have investigated surface and skin contamination from lead in a variety of

occupational settings and developed two analytical methods for identifying lead contamination. NIOSH Method 9100 is a surface-wipe collection method…

(The following excerpt is from page 6 of the NIOSH document.)

Other Guidelines and Best Management Practices

Association of Occupational and Environmental Clinics

The Association of Occupational and Environmental Clinics (AOEC) has reviewed current literature concerning lead exposure and health effects [AOEC 2007]. The AOEC has determined that the evidence provided by current health effects studies calls for an update of guidance for professionals involved with medical assessment and treatment of lead-exposed workers. Among other provisions in their guidance, the AOEC has determined that current evidence supports the need for: 1) qualitative assessment of the need for inclusion in a medical surveillance program for lead workers in addition to inclusion in a medical surveillance program based on documentation of exposure to airborne lead at a concentration above the OSHA action level; 2) increased frequency of BLL testing; 3) removal from exposure to lead for workers with BLL of 30 μg/dL or more; and 4) education of workers concerning occupational exposure to lead and provision of necessary personal protective equipment and administrative measures to prevent both occupational and take-home exposure to lead.

Environmental Health Perspectives Mini-Monograph

The March 2007 edition of Environmental Health Perspectives included a Mini-Monograph on adult lead exposure. Recommendations in this document include the following: 1) medical surveillance for all lead-exposed workers should include quarterly BLL testing for individuals with blood lead concentrations between 10 and 19 μg/dL, and semiannual testing when sustained blood lead concentrations are < 10 μg/dL; 32) pregnant women avoid occupational or avocational lead exposure that would result in blood lead concentrations > 5 μg/dL; 3) removal from exposure to lead for workers with BLL of 30 μg/dL or more or if a worker has a sustained BLL above 20 μg/dL; and 4) annual education of lead workers concerning occupational exposure to, and control of, lead hazards as well as ongoing access to health counseling regarding lead-related health risks to prevent both occupational and take-home exposure to lead.

Filter System Maintenance Recommendations:

(The following excerpt is from page 15 of the NIOSH document.)

Filter change-out should be performed by personnel trained in the removal and disposal of dirty filters and in lead safety. They should use appropriate personal protective equipment and environmental precautions.

RECOMMENDATIONS

(The following excerpt is from page 18 of the NIOSH document.)

Employer and worker education

- Inform workers about symptoms that may indicate a health problem. Also inform workers that elevated lead levels can occur without overt symptoms and that a blood lead level test should be done if there is concern about an exposure to lead. Common symptoms of lead poisoning in adults include nausea, diarrhea, vomiting, poor appetite, weight loss, anemia, excess lethargy or hyperactivity, headaches, abdominal pain, and kidney problems. Exposure to high noise levels can cause hearing problems, stress, poor concentration, insomnia, nervousness, anxiety, and depression. It can also cause accelerated heartbeat, high blood pressure, gastro-intestinal problems and chronic fatigue. Employers should advise employees to report these symptoms to their supervisors and physicians.
- Inform pregnant workers and shooters about the possible adverse health effects to the fetus from exposure to lead and noise. A fetus can be poisoned in utero. Studies show that fetal blood contains approximately 80% of the blood lead concentration of the mother. Pregnant workers and shooters, or those considering pregnancy, also need to know about the increased chance of miscarriage at blood lead levels > 5 µg/dL. Evidence also suggests that exposure to peak sound pressure levels above 155 dBC can cause hearing loss in the fetus beyond the fifth month of pregnancy. The evidence of whether the particular noise exposure associated with firing ranges is harmful to the developing fetus and warrants removal of the pregnant woman from exposure is ambiguous. This issue is further complicated because female workers may be exposed to lead and noise even before they know they are pregnant. Firing ranges might wish to establish guidelines for pregnant workers exposed to lead and noise.

Worker exposure and medical health monitoring

(The following excerpt is from page 20 of the NIOSH document.)

Worker health monitoring

Blood lead levels are currently the best indicator of personal lead exposure. Workers potentially exposed to lead should therefore be monitored for the presence of lead in blood ~~and the effects of lead on the blood-forming system~~. This assessment is necessary to ensure that engineering controls, personal hygiene practices, and PPE are preventing lead exposure.

- The OSHA general industry lead standard contains provisions for the medical monitoring of workers exposed to lead (29 CFR 1910.25(d)). NIOSH supports using these provisions for firing range workers but acknowledges that current understanding of health risks associated with lead exposure may require updated/additional provisions for medical surveillance. Recommendations from the March 2007 edition of Environmental Health Perspectives' Mini-Monograph on adult lead exposure and from the Association of Occupational and Environmental Clinics (AOEC) ~~recommends that a medical surveillance program contain~~ include the following elements:
    - Informing workers and shooters that levels of lead once thought safe are now known to be harmful. Advise that blood lead levels be kept below 10 micrograms of lead per deciliter (µg/dL) of blood.
    - Informing pregnant workers and shooters, or those considering pregnancy, about the possible adverse health effects to the fetus as well as the increased chance of miscarriage at blood lead levels > 5 µg/dL.
    - Workers should be included in a medical surveillance program whenever they are handling or distributing materials with a significant lead content that could potentially cause exposure through inhalation or ingestion.
    - New employees and those newly assigned to lead work should have a pre-placement lead medical examination and a BLL test, followed by periodic BLL monitoring, blood pressure testing, and health status review.
    - Monthly BLL testing is recommended for the first three months of employment in order to assess the adequacy of exposure control measures.
    - Testing frequency can be reduced to every six months as long as BLLs remain below 10 µg/dL, or quarterly for individuals with blood lead concentrations between 10 and 19 µg/dL.
    - Any increase in BLLs of 5 µg/dL or greater should trigger a re-examination of control measures.
    - Workers with BLLs of 30 µg/dL or more, or ones with a sustained BLL above 20 µg/dL, should be removed from lead exposure.
    - All lead-exposed workers should receive, annually, educational materials and prevention information about the health effects of exposure to lead from a clinician and the employer; and they should be provided necessary protections including protective clothing, clean eating areas, and hygiene measures such as wash facilities and/or showers to prevent both ingestion and take-home exposures.

(The following excerpt is from page 21 of the NIOSH document.)

The OSHA noise exposure standard (29 CFR 1910.95(d)(e)(g)(h)) requires the employer to establish a monitoring program and ~~maintain~~ provide audiometric testing to all employees whose exposures equal or exceed an 8-hour TWA of 85 dBA under the action level monitoring criteria.

REFERENCES

(The following excerpt is from page 22 of the NIOSH document.)

...

Kardous CA, Willson RD, Hayden CS, Szlapa P, Murphy WJ, Reeves ER [2003]. Noise exposure assessment and abatement strategies at an indoor firing range. Appl Occup Environ Hyg *18*(8):629–636.

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