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# Considerations in Range Cleaning

There are two primary areas of concern that must be taken into consideration to ensure the safety of range personnel, employees and those handling the waste stream for collection, transport, and disposal.

The first aspect of range cleaning to be considered is the presence of lead in the waste accumulated in the range. This material is a safety and health hazard (per the CDC and OSHA) and must be appropriately handled during collection and disposal. Lead is introduced to ranges in the form of lead oxides from burned primer mix, and metallic lead vapor generated from exposed lead on the heel of the bullet and from friction between exposed lead on the surface of bullets and gun barrels. This means lead is likely to be present throughout the range, from the shooting positions to the backstops and in traps.

- Wet collection of lead waste may be preferred to minimize the generation of breathable dust during collection.
- Regardless of collection method, respiratory protection rated for use in lead-contaminated areas should be considered.
- Collected water and wetted debris needs to be tested for the presence of lead before disposal to correctly determine the waste transportation and disposal classification.
- Collected wastes must be placed in an appropriate container that is labeled in accordance with local, state and federal regulations for contents, date of first collection, and more. Know and follow the laws on hazardous waste collection.

The second material requiring special consideration and handling in range wastes is smokeless propellant, or 'gunpowder.' When firing any type of firearm, a small percentage of the original propellant charge can be discharged as unburned propellant. This unburned propellant may extend forward well beyond the firing line. The amount of unburned propellant that will be present depends on the firearm type (pistol, revolver, rifle, or shotgun) and the type of ammunition in use. The accumulation of unburned propellant has been the root cause of fires at several commercial test ranges and accidents during the processing of collected wastes. Additionally, subsequent transport and handling of waste containing unburned powder has resulted in incidents, including fatalities.

Wet collection is advisable (e.g. wet mopping or vacuuming). If using a HEPA wet vacuum[1], water should be added to the collection tank along with a wetting agent, such as Triton X-100 or equivalent, prior to use to ensure propellant that is collected does not sit on top of the water due to surface tension. Contents of the vacuum collection system should be removed and the vacuum thoroughly

[1] Using a "HEPA" filter in a conventional vacuum system does not qualify as a "HEPA wet vacuum system."

cleaned out after each use.  Filters should be regularly replaced, and contaminated filters should be appropriately disposed of based on local, state and federal regulations.

Throughout the collection, handling, and storage process, propellant wastes should remain wet to minimize the risks presented.

Waste material containing both lead and unburnt propellant should be transported and disposed of in accordance with federal, state, and local regulations. There are several commercial companies that provide both cleaning and hazardous materials (HAZMAT) disposal services.

Environmental controls also apply in the disposal process.

Finally, it is strongly recommended that ranges create, maintain, and follow written procedures for range cleaning practices to ensure on-going compliance.

**Reference Materials**

- **OSHA Lead Standard**
- **OSHA General Industry Regulations**
- **Hazardous Materials Regulations**
- **Protection of Environment Regulations**
- **State and Local Regulations**