

Brownfields Newsletter

KNIK TRIBE
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Lead in the Last Frontier

Lead contamination may sound like an issue of the past, but it remains an ongoing concern across Alaska. From legacy mining sites and old building materials to ammunition used for subsistence hunting and lead weights used in fishing, lead continues to pose a threat to both human health and the environment.

The Alaska Department of Health reports that lead exposure cases still occur each year—often through unexpected pathways. For communities revitalizing former industrial or contaminated lands through Brownfields redevelopment, understanding these pathways is key to ensuring safe cleanups, human health protection, and long-term stewardship of the land.

This issue of the Brownfields Newsletter explores where lead contamination occurs, how exposure happens, what can be done to reduce risks, and what safer alternatives are available to protect people, wildlife, and communities.

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What Is Lead and Why It's Dangerous

Lead is a naturally occurring metal that was widely used in paint, plumbing, fuel, and industrial materials for decades. Once released into the environment, it does not degrade. Lead can remain in soil, sediment, and dust for generations—posing risks to people who live, work, or play near contaminated sites.

Children are particularly vulnerable to lead exposure. Even low levels of lead in the bloodstream can affect brain development, behavior, and learning, and can cause health problems such as anemia and vitamin D issues. Babies can also be exposed in utero when the mother experiences exposures, so pregnant women should take special care to avoid lead for the protection of their babies. In adults, exposure can lead to high blood pressure, kidney damage, and reproductive problems.

Exposure Pathways in Alaska

1. Legacy Contamination

- **Old mining and industrial sites:** Former mining, smelting, or fuel-handling sites are hotspots for lead contamination. Tailings piles, storage yards, and contaminated soils can contain elevated lead concentrations.
- **Informal shooting areas:** Locations that have been used for recreational shooting can accumulate large quantities of lead. Lead projectiles accumulate in backstop areas, and lead dust can accumulate over shooting areas.
 - Example: Reflections Lake near the Knik River was once the site of extensive shooting. The State of Alaska removed contaminated soil from the site and capped other areas to make the site safe for public use.
- **Abandoned military or transportation facilities:** Paints, batteries, and fuel additives used in these settings often contained lead.
 - Example: At the Eklutna Army Site in Chugiak, multiple areas of lead contamination were uncovered during assessment activities performed by the Native Village of Eklutna and the Army Corps of Engineers, likely from the use of lead-based paint during the Army's use of the site.
- **Urban infill and redevelopment sites:** Even vacant lots or downtown parcels may have legacy lead from past paint, fuel, or waste disposal. Brownfields assessments often identify lead as a key contaminant of concern. Proper site investigation and remediation are critical before redevelopment.
 - Example: the Matanuska Maid Block in downtown Palmer was historically used for various industrial applications, including a power plant. The block has the focus of a Brownfields Assessment and Cleanup Effort, and lead was found in soil and groundwater at the site. The area has mostly been cleaned up and redeveloped and currently houses two brewery/restaurants and other businesses.

2. Occupational and Take-Home Exposures

- Workers involved in mining, construction, welding, or demolition can inhale or ingest lead dust, which can also cling to clothes or tools and be carried. This “take-home” exposure route is a well-documented concern in Alaska mining communities.
 - Brownfields cleanup crews should always follow safe work practices: use proper personal protective equipment (PPE), change clothes before leaving work, and avoid tracking dust into their vehicles.
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Exposure Pathways in Alaska (con't)

3. Hunting, Fishing, and Recreation

Lead ammunition and fishing tackle remain common throughout Alaska. When game is harvested using lead bullets, microscopic fragments can remain in the meat, which may expose hunters and their families. Studies in Alaska have found that about half of children with elevated blood lead levels had eaten game killed with lead ammunition.

Similarly, melting or casting fishing weights can release lead fumes, and shooting ranges can accumulate lead in soil and dust over time. Lost fishing gear and lead shot can be eaten by birds and result in illness, reproductive impairments, and death. One #4 birdshot ingested by a bald eagle is enough to kill the eagle from lead poisoning.

Brownfields Connection: Many rural shooting ranges or abandoned recreation sites have been identified as small Brownfields because of lead shot accumulation. These areas can often be cleaned up and safely reused as community spaces, with proper remediation and monitoring.

The Knik Tribe's Brownfields Program recently received an award through the Thriving Communities Program to investigate lead contamination at a shooting site in the Goose Bay State Game Refuge. The site was once used by the Tribe for its Educational Fishery program and other Culture Camp activities. After significant lead levels were discovered, this use of the site ceased. Through the assessment activities to be performed in Summer 2016, the Brownfields Program hopes to lead the way towards cleaning and reusing the site.



ADFG BOAT LAUNCH AREA AT THE GOOSE BAY STATE GAME REFUGE. THIS IS THE SITE OF AN UPCOMING LEAD SCREENING AND CHARACTERIZATION PROJECT FOR THE KNIK TRIBE'S BROWNFIELDS PROGRAM

4. Building Materials in Older Buildings

Although Alaska has fewer pre-1950 homes than most states, older housing units may have lead-based paint and/or water systems that contain lead-based plumbing, solder, or fixtures. Water that sits in these pipes for long periods can absorb lead. Lead-based paint can degrade over time, flaking into small particles which can be ingested and inhaled.

Redevelopment of older structures under the Brownfields program offers opportunities to replace outdated plumbing, test water supplies, and ensure long-term safety for future occupants.

Remediation and Cleanup Approaches

Assessment

Phase I and Phase II Environmental Site Assessments help identify where lead contamination exists- whether in soil, water, dust, or building materials. Soil testing, x-ray fluorescence (XRF) screening, and laboratory analysis are commonly used tools during these assessments. An accurate assessment of the extent of contamination is vital to inform effective cleanup and remediation efforts.

Cleanup Techniques

- **Soil removal and replacement:** Excavating contaminated soil and replacing it with clean fill is often the most direct solution for small sites. The removed soil must then be disposed of at an appropriate location. Excavated lead-contaminated soils in Alaska often need to be shipped out of state for disposal, which significantly increases the costs associated with cleanup efforts.
- **Soil stabilization:** Binding lead with phosphate or other stabilizers reduces its mobility and prevents leaching.
- **Capping:** Covering contaminated soil with clean material, asphalt, or vegetation can prevent human or animal contact and dust emissions.
- **Building remediation:** Lead-based paint can be removed, encapsulated, or replaced using certified contractors following EPA Renovation, Repair, and Painting (RRP) standards.



Health and Safety: Reducing Risks at Home

While lead may sound scary, there are simple ways that you can reduce you and your family's risk of exposure. By following the recommendations below, risks can be reduced dramatically, and you can avoid negative health effects due to lead exposure.

- Wash hands frequently, especially before eating. Hand-to-mouth is one of the most common exposure pathways, especially in children.
- Leave work clothes and boots outside of living spaces if you work with metals, paint, or ammunition.
- Test private wells and older plumbing for lead.
 - The **Mat-Su Test Lab** (www.matsutestlab.com) is a local option for having this testing performed.
- Use non-lead alternatives for ammunition and fishing gear. See the "Safer Alternatives" section on the following page for recommendations and resources.
- Have children tested for lead if they may be at risk.
 - The State of Alaska Environmental Health Program provides lead testing kits to State Public Health Centers. These Health Centers are located throughout the state, including Wasilla and Anchorage.



Safer Alternative and Prevention

Activity	Lead-free Alternative	Comments
Hunting, Shooting, Reloading	Copper or Steel ammunition	<p>Lead bullets can fragment on impact, contaminating meat and soil. Lead shot can be ingested by birds directly or by consuming tainted meat.</p> <p>Cost is often higher than lead, but prices are coming down as alternative ammo becomes more popular</p>
Fishing	Tin, bismuth, or tungsten sinkers	<p>Lead sinkers and jig heads are toxic to fish and birds and can contaminate water and sediment.</p> <p>Cost is becoming increasingly affordable. Lead alternatives have comparable performance and less environmental impact</p>
Plumbing	Certified "lead-free" fittings and solder; PEX or copper piping	Lead can leach into drinking water from older plumbing materials. Have water tested and replace plumbing components if necessary.
Paint Removal	Use wet sanding and HEPA vacuums to prevent dust- never dry scrape	Lead-based paint removal should be done in accordance with established EPA best practices. Improper removal can mobilize the lead paint and result in human and environmental exposures.

<p align="center">Knik Tribe Brownfields Program</p>	<p align="center">KROBILLARD@KNIKTRIBE.ORG</p>
<p align="center">WWW.KNIKTRIBE.ORG/ALASKA-KNIK-TRIBE-BROWNFIELDS-PROGRAM</p>	<p align="center">1800 LAUREL DRIVE PALMER, AK 99645</p>