

**Town of Lyons Ecology Advisory Board Recommendations for the Boulder
County Proposed Shooting Range at the Cemex Quarry
3/5/3018**

The Town of Lyons Ecology Advisory Board (EAB) has been asked by Mayor Connie Sullivan to weigh in on the proposed shooting range currently being planned for the Cemex quarry to the north of Rte. 36. While it is the EAB's understanding that this range is not within Town of Lyons limits, it is in the Lyons Planning Area and will certainly affect current and future residents.

The EAB can comment only on research done by others and case histories. None of the opinions offered here is a result of any studies undertaken by the EAB. Included here also are opinions of the EAB members based on their familiarity with the proposed site area.

Copies of documents used in this report are included for reference.

Lead Contamination and Water Runoff

The vast majority of firearm bullets are lead-based. Depending on the usage of the range, there is the potential for hundreds of pounds of lead or more to be deposited annually within the shooting range.

In a May 2012 publication, [Corrective Action at Outdoor shooting Ranges Guidance Document](#), the Hazardous Materials and Waste Division of the Colorado Department of Public Health and Environment reports that "most contamination at outdoor small arms shooting ranges consists of heavy metals wastes from ammunition fired at the site." The most common contaminant is lead, but arsenic, cadmium and zinc may also be present.

The report further states,

"Lead can be introduced into the environment through oxidation of bullets and shot when it is exposed to the air. Breakdown of ammunition may also occur if the materials are allowed to weather and are exposed to freeze/thaw cycles. Lead can dissolve when it is exposed to acidic soil and water. Dissolved lead can then migrate through soil or fractured rock to ground water. In addition, lead bullets, shot, fragments, and dissolved lead can be transported by storm water runoff, which can result in the spread of soil contamination and impacts to surface water."

As is commonly known, lead has many adverse effects on humans, animals, and plants. The containment of lead from the proposed range is of paramount importance.

While the EAB did not have access to geologic data, our empirical observations see a shooting range situated on a hillside, whose water runoff generally ends up in the St. Vrain River. While the Loukenon sandstone quarry intervenes between the site and the river, the EAB believes there must be a very strict runoff plan for the range site to mitigate any lead entering the downhill river.

The range site should also follow best management practices to control the flow of storm water from the site. Runoff should be captured onsite and not allowed to flow freely downhill.

The runoff from the site should be modeled on a worst-case rainfall event. A large amount of water running through the site over a short event may flush large amounts of lead into the nearby river and aquifer.

The proposed site should also be analyzed carefully for the escape of lead-contaminated water into the ground water. As this site is an old quarry where the rock has been blasted and excavated, it is expected that the underlying strata has been fractured and will allow water to percolate into the groundwater table.

During the life of an active shooting range, the range operators and owners should follow the best management practice of the above-referenced document that should include a lead management program to “reduce the mobility of lead in the environment.”

The practices include a periodic removal and sifting of the soil used as a backstop to remove the lead bullets. The removed lead is then handled as a hazardous waste and disposed of properly.

As a reference where an older shooting site was not well managed, Adams County recently has been working on a shooting range remediation.

Expensive clean-up considered at old Adams County shooting range

Wildlife Considerations

The area uphill from the proposed range is a Ponderosa pine forest, populated by mule deer, mountain lions and elk (seasonal). It is also in close proximity to areas of Heil Valley Ranch to the west designated by Boulder County Parks & Open Space as sensitive habitat, where no humans are allowed.

Seasonal elk populations use the meadows above and to the west of the proposed gun range. While no definitive studies were found on how gunfire noise affects large mammals, it is the EAB’s opinion that regular gunfire may cause the elk to abandon these areas.

Likewise, mule deer may be impacted by the noise. For deer, this could be especially detrimental as deer traverse the area above the site to reach water in the St. Vrain River. In the summer, this is often the only source of water and there is a potential for disruption.

Within Heil Valley Ranch, golden eagles and prairie falcons nest in the cliffs and canyons. Given that the Town of Lyons was required to apply for a “take permit” when doing flood restoration work within a certain distance from nesting golden eagles, it is strongly suggested that any plans for this shooting range be coordinated with the U.S. Fish & Wildlife Service. A wildlife impact study may be required.

Of note, Boulder County prohibits the discharging of firearms within Heil Valley. At first glance, it seems obvious this may be for safety and prohibition of hunting within the open space, but we urge any planning for this shooting range to also explore the effect of noise on wildlife.

Fire

It appears that the proposed site will be enclosed within an old quarry with very little chance of a bullet sparking a fire in the nearby dry land Ponderosa forest. It is well- documented that sparks from bullets

striking rocks has started wildfires. In fact, during dry conditions shooting in the local national forests is prohibited. The EAB would only urge that the risk of fire-by-bullet-spark be thoroughly researched in the planning of this range.

Noise

Beyond the impact of gunfire noise on the wildlife in proximity to the range, the EAB also recognizes the effect of a regular diet of gunfire noise on Town of Lyons residents and those Boulder County residents near the range. We understand that there have been noise tests conducted for the proposed range but we would urge additional noise analysis. It is the EAB's understanding that the study had limited receptor points. From EAB members' experience, noise resonates differently in the Lyons valley. For example, on Corona Hill, noise from the Cemex plant is often evident yet it is not heard elsewhere in town. Likewise, noise from Plant Bluegrass festivals or concerts at Bohn Park is perceived differently in different parts of town.

Reclamation

The EAB recommends that there be in place a reclamation plan for the shooting range to ensure it is properly restored when the range is decommissioned in the future. The EAB assumes that there is already on file a restoration plan for the present condition of the quarry, and recommends questioning what the current reclamation plan entails, how the proposed range would affect that current reclamation plan, and what reasons Boulder County may have not to hold the quarry operation to the existing reclamation plan.

Any reclamation plan proposed for the shooting range must account for lead remediation and any other cleanup necessary after the range is no longer operating.

Recommendations:

- **The proposed site design should adhere to the [Colorado Department of Public Health and Environment's Corrective Action at Outdoor Shooting Ranges Guidance Document](#)**
- **and the Environmental Protection Agency's [Best Management Practices for Lead at Outdoor Shooting Ranges](#)** .
- While the former largely deals with corrective actions to existing shooting ranges, the guidance provided is invaluable in the planning of a new range.
- **A thorough hydrologic site evaluation must be performed** in order to show the flow of both surface water and subsurface water from the shooting range, the risks to the St. Vrain River and groundwater and a detailed plan for how the effects of the range's runoff will be mitigated so that no water escapes the site. (Even a small amount of lead can have serious effects on humans and animals.)
- **A plan must be in place before construction to account for how the range will periodically remove lead from the background berms.** How often will this action be performed and how will the extracted lead be handled?

- **Ensure that effects of gunfire noise on wildlife in proximity to the shooting range are thoroughly researched**, especially on golden eagle nesting sites and on deer and seasonal elk populations.
- **Conduct additional noise studies at various other points in Lyons** besides those locations already tested.
- **Thoroughly research the possibility of the shooting range sparking a wildfire** and mitigate risk as appropriate.
- **Ensure there is a reclamation plan for the shooting range once it is decommissioned**, and that that plan accounts for lead and other hazardous materials, and how that plan dovetails into the current quarry restoration plan.

Regards,
Steve Simms
Town of Lyons
Ecology Advisory Board Chairman
ecology@townoflyons.com