



REGION 8

DENVER, CO 80202

December 7, 2023

MEMORANDUM

SUBJECT: Minor Modification of the OU1 Selected Early Interim Action Remedy at Colorado Smelter Superfund Site, Pueblo County, Colorado.

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TO: Colorado Smelter Operable Until 1 (OU1), Post-Early Interim Action Record of Decision (i-ROD) Site File

PURPOSE:

The purpose of this memorandum is to document the justification for a minor modification to the OU1 selected remedy at the Colorado Smelter Superfund Site, Operable Unit 1, Pueblo County, Colorado. This modification is to allow cleanup of properties that may have one or more Decision Units (DUs) where contaminant concentrations exceed Remedial Action Objectives (RAOs), but did not warrant cleanup based on area weighted averaging. The modification is based on the data provided by Pueblo Department of Public Health and Environment (PDPHE) documenting the occurrence of Elevated Blood Lead Levels (EBLs) in resident children, at such properties and only one property within OU1 will require cleanup under this modification.

BACKGROUND:

The Colorado Smelter Superfund Site (Site), EPA ID: CON000802700, is located about 110 miles south of Denver, Colorado. The Site consists of two Operable Units, OU1 – Community Properties and OU2 – Former Smelter Area. An Early Interim Action Record of Decision (i-ROD) was signed on September 26, 2017, to address Smelter-related lead and arsenic contamination in neighborhood soils and indoor dust at homes within OU1. The OU1 and OU2 Remedial Investigations (RIs) are ongoing, and OU1 cleanup actions are ongoing, to address OU1 Smelter-related contamination. A Record of Decision has not yet been signed for OU2.

As of a September 2022 Site Study Area expansion, OU1 now comprises approximately 2,030 residential properties' and up to 250 commercial properties' exterior soils. As of September 1, 2023, the current residential sampling is at 1,653 indoor dust (81%) and 1,953 soil (96%) complete. The current dust cleanup completions are 499 out of an estimated 635 cleanups needed (78%). For residential soil, 790 out of an estimated 858 yards (92%) have been cleaned up. Soil cleanup

completion is planned for late-2023 to March 2024, and dust cleanup completion is planned for early-to mid-2024.

The 2017 i-ROD identified the following OU1-specific RAOs to protect human health from lead and arsenic at the Site and to describe what the cleanup will accomplish. The principal RAO for the Site is to protect human health from Site-related contaminants, namely lead and arsenic. The EPA considers current and reasonably anticipated future use of the site when determining RAOs. Based on current zoning of the Site, the reasonably anticipated future uses at most properties include residential use. Therefore, the EPA has determined that residentially zoned property within OU1 should be remediated to meet residential land-use criteria. Non-residentially zoned properties will be evaluated as part of future actions. The RAOs outlined below will reduce exposure to elevated levels of arsenic and lead in soils and dust, thus reducing the potential for health impacts associated with such potential exposure.

RAOs for Arsenic and Lead in Soil - The RAOs for arsenic and lead in soil are intended to reduce human exposure to soils with contamination exceeding health-based cleanup levels. The arsenic cleanup level is 61 milligrams per kilogram (mg/kg or parts per million (ppm)), and the lead cleanup level is 350 ppm. The Hotspot or Not to Exceed (NTE) cleanup level for arsenic is 1,000 ppm and for lead is 1,918 ppm.

RAOs for Arsenic and Lead in Indoor Dust - Similarly, the RAOs for arsenic and lead in dust are intended to reduce human exposure to indoor dust exceeding the health-based cleanup levels for arsenic and lead in indoor dust. The indoor dust arsenic cleanup level is 61 ppm and the indoor dust lead cleanup level is 275 ppm.

The response action selected in the i-ROD was selected to protect the public health or welfare of the environment from actual or threatened releases of smelter-related hazardous substances into the environment.

The i-ROD's Selected Remedy is described as "Soil Removal and Replacement to 18 Inches Below Ground Surface with Indoor Dust Cleanup." The Selected Remedy consists of two main components, which are the residential soil remedy and the indoor dust remedy.

For the Residential Soil Remedy, residential soils are evaluated and removed down to 18 inches if concentrations of contaminants in those soils exceeded the cleanup levels for lead or arsenic. Soil removal and replacement is a three-stage process involving:

1. Excavation of contaminated soils,
2. Disposal of excavated materials at an appropriate offsite location, and
3. Replacement with clean soils to either 12 or 18 inches. In cases where contamination that exceeds the cleanup levels is left in place below 18 inches, a visible barrier/marker, such as snow fence or geotextile material, will be placed.

The first step to determine if excavation is needed is to evaluate contamination levels down to 18 inches and look at each area-weighted average contamination level at the different sampling intervals, that is, depths of 0-1, 1-6, 6-12 and 12-18 inches across the whole yard. Soil cleanup will be conducted

where the area-weighted average for any interval from 0-18 inches across the entire yard (i.e. exposure unit (EU)) exceeds the corresponding arsenic or lead cleanup level. For properties where the area-weighted average contamination level for any of the sampling intervals above 12-18 inches requires cleanup, but the 12-18-inch interval does not, excavation would extend only to 12 inches.

For properties where the area-weighted average contamination level for the 12-18-inch interval exceeds the cleanup levels, excavation would extend down to 18 inches. In addition, confirmation sampling would be performed at the 18-inch depth, and a visible barrier (geotextile or snow fence) would be put in place if contaminant concentrations in the remaining soil still exceeded cleanup levels. Soils in play areas and gardens are initially included in the area-weighted averaging, but they are also evaluated separately when compared to cleanup levels. In addition, any DUs having soil contamination above the Hotspot/NTE level of 1,000 ppm of arsenic or 1,918 ppm lead at any depth sampled will be removed to a maximum depth of 18 inches. A visible barrier will be placed at the final excavation depth of 18 inches for Hotspot/NTE DUs, or 24 inches for gardens and play areas, if confirmation soil sample results show that contamination in soils left in place are greater than cleanup levels. Based on sampling data obtained prior to the 2017 i-ROD, the EPA estimated that approximately 5-6 yards out of 1,900 properties may require a Hotspot or NTE cleanup; however, these properties may be fully remediated if their yard average concentrations exceed the cleanup level.

Based on sampling data the EPA had obtained up to the time of the 2017 i-ROD, this alternative estimated removing and replacing all soil from 817 yards to 12 inches, with excavation to 18 inches at 195 of the 817 yards, totaling about 10% of the 2,030 residential properties in the Site study area. As of September 2023, approximately 43% of properties sampled need soil removal and replacement, and only one property required cleanup due to exceeding the lead NTE level.

For the Indoor Dust Remedy, indoor dust is evaluated and cleaned up if concentrations of contaminants exceeded the dust cleanup levels for lead or arsenic. Removal of contamination from indoor surfaces may be accomplished by cleaning contaminated surfaces or by removing and replacing contaminated surfaces. Cleaning interior surfaces can be accomplished by a variety of conventional wet cleaning techniques including wet mopping floors; washing walls; wiping down or washing counters, furniture, and decorations; shampooing carpets; and high efficiency particulate air [filter] (HEPA) vacuuming. If the contamination in carpets cannot be cleaned, it is addressed by removal and replacement or other best management practices.

In many cases, indoor lead dust cleanups take place in coordination with a soil cleanup; however, the i-ROD indicated a small percentage of homes that receive indoor dust cleanups will not require outdoor soil cleanups because the arsenic and lead in their soils do not exceed the soil cleanup levels. This is because people generally spend a significant time indoors, so the overall risk of exposure to smelter-related dust contamination may be higher in some homes than the risk of exposure to contamination in their yard soil.

Based on sampling data the EPA had obtained at the time of the 2017 i-ROD, an estimated 30% of the properties in the study area, approximately 578 homes, would require an indoor dust cleanup. As of September 2023, approximately 35% of the homes sampled require dust cleanup.

2017 i-ROD Site Risk Considerations

At the time of the i-ROD, Region 8 risk considerations included completion of two required consultations with the EPA's Office of Superfund Remediation and Technology Innovation prior to finalizing Site-specific cleanup levels and cleanup decision documents. The EPA Region 8 Site team consulted with EPA headquarters' Technical Review Workgroup Lead Committee and then with the Site Assessment and Remedy Decisions Branch of the Office of Superfund Remediation and Technology Innovation. Both groups reviewed and approved the EPA Region 8's use of Site-specific and updated default input parameters in the Integrated Exposure Uptake Biokinetic (IEUBK) model for children to derive the Site-specific PRGs for lead in soil and dust. The December 2016 Office of Land and Emergency Management (OLEM) Directive (#9200.2-167), also known as the EPA's Updated Scientific Considerations for Lead in Soil Cleanups, requires that specific consultations occur for sites where lead is a principal contaminant of concern. The OLEM Directive #9200.2-167 suggests that a target blood lead level of 2-8 micrograms per deciliter ($\mu\text{g}/\text{dL}$) may be more appropriate and should be considered in some cases. For example, the 2013 Integrated Science Assessment for Lead found that several studies have observed "clear evidence of cognitive function decrements in young children with blood lead levels between 2-8 $\mu\text{g}/\text{dL}$." Because of this, the OLEM Directive recommends consideration of existing lead policy as well as:

- Current scientific evidence of adverse health effects associated with blood lead levels below 10 $\mu\text{g}/\text{dL}$
- Site-specific bioavailability of lead-containing source materials
- The use of additional Site-specific IEUBK model input parameters to derive screening levels
- Continued use of Superfund removal authorities to address imminent risks
- The role of natural and human-influenced background levels
- A multi-pathway approach working across programs and including collaboration with federal state, and local partner agencies
- Prioritization of resources for investigation and assessment of lead sites

Remedial Action Work Plan Cleanup Prioritization Scheme

The i-ROD also noted that the remedy is necessary to protect current and future residents, other users of these properties, and for the long-term protectiveness of the remedy. However, when initiating the Remedial Action Work Plan (RAWP), EPA Region 8 RPMs and Risk Assessors determined the need to also develop the following cleanup prioritization scheme to support the RA and cleanup activities at residential properties within the Site. The cleanup prioritization scheme was documented by EPA Risk Assessment contractor, Syracuse Research Corporation (SRC) and is included as Appendix B of the RAWP. It aligns with the Residential Lead Sites Handbook (USEPA, 2003), which cites that a tiered-response approach is recommended for prioritizing clean-up actions. Due to the size and complexity of the Site, it is well suited to implementation of response actions over an extended period of time.

Generally, cleanup prioritizations for lead consider population demographics in order to be protective of the most sensitive receptor, a child resident. However, residential properties within OU1 include roughly 50% rental properties, and there is a high turnover of the population within this community. Because of this, even if children are not currently present within a home at the Site, it is reasonable to anticipate a child or multiple children could inhabit that home within the near future. On this basis, the cleanup prioritization described below does not differentiate priority based on population

demographics at individual residences, as it is assumed in this priority scheme that in each household there is a “theoretical” child of susceptible age living in the home.

The prioritization criteria for scheduling residential cleanups, is as follows:

1. Interior of properties with indoor dust lead data where the (IEUBK model predicts blood lead levels (BLLs) greater than 20 µg/dL, with eight weeks to conduct exterior remediation after interior cleaning is completed.
2. Exterior of properties with average surface soil lead or arsenic concentrations that are higher than the not to exceed (NTE) cleanup levels (1,918 mg/kg for lead and 1,000 mg/kg for arsenic) established in the i-ROD.
3. Any properties with both surface soil and interior dust lead data where the IEUBK model predicts greater than 25% chance of exceeding the target BLL of 6.24 µg/dL identified in the i-ROD.
4. Properties in a given area/neighborhood near where cleanup activities are occurring due to the three tiers above to minimize frequency of disturbance to residents in that area.

Rationale for Minor Modification

Although not part of the RAOs and despite having the above i-ROD and RAWP prioritization criteria in place, EPA RPMs identified a gap in our tiered-response approach as per the Residential Lead Sites Handbook. That is, health information shared by the Pueblo Department of Public Health and Environment Lead Program (PDPHELP) for on-going blood-lead screening, healthy homes risk assessments, and lead health education and outreach to community members showed that:

1. Sensitive age groups have documented EBLs within an OU1 home.
2. A PDPHELP healthy home risk assessment following EBL case initiation shows in-home sources of lead-based paint hazards have not been released to the living spaces, therefore the EBLs are not attributable to in-home lead sources.
3. A least one DU is above our RAO and has no protective barrier (e.g., grass, mulch or rock) to reduce exposure .
4. PDPHELP documentation of sensitive age group individuals' and pets' frequent use of the DU that exceeds our RAO.

Section 7.2 of "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents" (OSWER 9200.1-23P) defines non-significant or minor changes as changes that usually arise during design or construction, when modifications are made to the functional specification of the remedy to address issues such as performance optimization, new technical information, support agency/community concerns and/or cost minimization (e.g. value engineering process). The definition further states "The change will not have a significant impact on the scope, performance or cost of the remedy."

In this case, the scope of the cleanup remedy is unchanged; that is, the technology (soil removal and replacement), physical area of the response (residential yard), and type and volume of wastes to be addressed (exterior soils in a residential yard) are consistent with the rest of OU1 response actions. The home's exterior soils pose a current and ongoing threat to the residents who comprise sensitive age group receptors (three children and one woman of child-bearing age). The risk of not acting is increased potential of life-long detrimental health and other negative impacts from elevated lead

levels in yard soils. Soil cleanup levels that would be used at this parcel are the same as for the remaining OU1 properties under the i-ROD; that is, there are no performance changes and there are insignificant increases in costs to add this parcel to the i-ROD cleanup objectives when compared to feasibility study cost estimate allowances of +50 percent to -30 percent. Even with the cost estimate allowances, there is no expectation of a great number of parcels needing cleanup under this modification due to the i-ROD response nearing completion and lack of reportable blood lead levels in unaddressed residences. The Colorado Department of Public Health and Environment, the support Agency, has been briefed of this modification action and is supportive. Additionally, we anticipate the Site's active Community Advisory Group, who would like as many properties cleaned up as possible, will be supportive of this action.

EXPLANATION AND SUMMARY OF MINOR MODIFICATION:

Although there is a DU above the RAO, the area-weighted average for the whole yard is not above our Site-specific clean-up level; therefore, it did not qualify for a cleanup under the i-ROD. Additionally, the prioritization criteria did not adequately consider EBLs and property-specific conditions warranting cleanup. This minor change meets the RAOs defined in the ROD by reducing human exposure to lead-contaminated soil, preventing ongoing or recurring EBLs in the most sensitive age groups in our study area.

The goal of this action would allow for the removal of contaminated soil above the Site RAO for lead using the same processes the project has used since January 2018. In summary, conducting cleanup will not change the scope of the remedy, that is, soil removal and restoration. Nor would this action change the performance; that is, the Site lead cleanup levels/RAO. Regarding cost, only one home falls into this universe needing priority cleanup while the RA contractor has task order scope, funds, and work force capable to complete the work in a timely manner allowing one year operational and functional review of the remedy.

In accordance with Section 7.3.1 of "A Guide to Preparing Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents," this change will be documented in the Post -i-ROD site file and will also be presented to the impacted community with a Remedial Design Fact Sheet.