Explanation of Significant Differences
Community Soils Operable Unit
Anaconda Smelter NPL Site
June 2020

1.0 Introduction

This Explanation of Significant Differences (ESD) describes two significant changes and several minor changes to the remedy for the Community Soils Operable Unit (OU) of the Anaconda Smelter Superfund Site (the Site) as identified in the 1996 Community Soils OU Record of Decision (ROD), 2013 Community Soils OU ROD Amendment, and 2017 Community Soils OU ESD. This ESD provides information about these changes (primarily to the 2017 ESD) and includes the site history, selected remedy, basis for the changes, support agency comments, statutory determinations and documentation of public participation compliance.

The U.S. Environmental Protection Agency (EPA) is the lead agency for this ESD, with support from the Montana Department of Environmental Quality (DEQ). The changes to the remedy are based on the development of a site-wide institutional controls implementation and assurance plan and data and technical analysis provided in *Agency of Toxic Substances and Disease Registry (ATSDR) Health Consultation – Exposure Investigation for Blood Lead and Urine Arsenic at the Anaconda Co. Smelter Site (ATSDR, 2019).*

EPA will publish a notice of availability and a brief description of the ESD in local newspapers (as required by 40 CFR Section 300.435(c)(2)(i)(B)). This ESD and supporting documents referenced herein will become a part of the Community Soils OU Administrative Record file and information repository (as required by 40 CFR Sections 300.435(c)(2)(i)(A) and 300.825(a)(2)).

Comprehensive information on the Anaconda Smelter Superfund site is available at:

U.S. Environmental Protection Agency
Region 8 Superfund Record Center
10 West 15th Street, Suite 3200
Helena, Montana 59626
(by appointment and during regular business hours)
and

Arrowhead Foundation
Technical Assistance Group
118 East 7th Street
Anaconda, Montana 59711

2.0 Site History and Enforcement Activities

The Site is located in the Deer Lodge Valley in southwestern Montana, in and around the city of Anaconda. Milling and smelting activities conducted in the Anaconda area for nearly 100 years resulted in the contamination of soils, surface water, and ground water in the surrounding area, primarily through airborne emissions and disposal practices from smelting operations. The primary contaminants are arsenic, cadmium, copper, lead, and zinc.

The Site was added to EPA's National Priorities List (NPL) in 1983, under Superfund authority. The Atlantic Richfield Company (Atlantic Richfield or AR) was identified as the primary potentially responsible party for the Site. Since then, AR has been actively involved in investigation and cleanup at the following five operable units:

1. Mill Creek OU. This first clean-up action involved relocating residents from Mill Creek and other soil stabilization and removal efforts.

2. Flue Dust OU. The second clean-up action addressed flue dust through removal, treatment, and containment in an on-site repository. At the same time, AR removed the Arbiter and beryllium wastes and contaminated residential yard materials from portions of Anaconda.

3. Old Works/East Anaconda Development Area (OW/EADA) OU. The third clean-up action addressed waste sources within the OW/EADA OU.

4. Community Soils OU. The fourth clean-up action addresses all remaining residential and commercial soils in Anaconda, Opportunity and the surrounding area.

5. Anaconda Regional Water, Waste and Soils OU. The fifth and final OU addressed all remaining contamination at the site, including large volumes of wastes, slag, tailings, debris, and contaminated soil, ground water, and surface water that are spread over 300 square miles of agricultural, pasture, rangeland, forests, and riparian and wetland areas.

3.0 Selected Remedy and Summary of Work

The Community Soils OU remedy was documented in a 1996 ROD. The 1996 ROD addressed all remaining residential and commercial/industrial soils of the Site and brought closure to previous removal actions. Major components of the remedy included: 1) removal of residential soils with arsenic concentrations above an action level of 250 parts per million (ppm) to a maximum depth of 18 inches; 2) treatment or covering commercial/industrial soils with arsenic concentrations above an action level of 500 ppm; 3) constructing an engineered cover over contaminated railroad bed materials on the active line through Anaconda; 4) cleanup of future residential and commercial/industrial soils, at the time of development, through the Anaconda-Deer Lodge County (ADLC)

Development Permit System (DPS); and 5) implementation of institutional controls (ICs) to provide educational information to residents describing potential risks and recommendations to reduce exposure to residual contamination.

In 2002, EPA and DEQ approved the Residential Soils Remedial Action Work Plan/Final Design Report for the Community Soils OU. Between 2002 and 2010, approximately 1,740 residences in Anaconda and the surrounding rural area were sampled with approximately 350 yards cleaned up where the area-weighted average arsenic concentration exceeded the 250 ppm action level in the surface soil. Approximately 39 acres of commercial properties exceeding the 500 ppm action level were also cleaned up.

An engineered cover consisting of crushed rock was placed on the active railroad line through Anaconda, including the active west and east rail yards. After the ROD was issued, EPA became aware of several abandoned or historic rail and/or trolley lines within and west of Anaconda. Consistent with the 1998 Anaconda Regional Water, Waste and Soils OU ROD, waste materials associated with these abandoned lines were removed and consolidated into designated waste management areas at the Site.

Based on data collected during the remedial action and concerns raised during the 2005 five-year review, EPA completed a ROD amendment in 2013 to incorporate fundamental changes to the original remedy to ensure protection of human health. Changes were primarily due to concentrations of lead in residential soil being significantly higher than those reported in the original remedial investigation/feasibility study as well as changes to the extent and distribution of contamination within certain residential areas of the Site. The amended remedy included the addition of a cleanup level for lead in residential soils (400 ppm) and cleanup levels for arsenic and lead in accessible interior dust (250 and 400 ppm, respectively) as well as the expansion of ICs to provide for a health education program which is currently implemented through the Anaconda - Deer Lodge County (ADLC) Community Protective Measures Program (CPMP). Since issuance of the ROD amendment, a substantial number of additional residences have been sampled and remediated.

In 2017, EPA completed a Community Soils OU ESD that changed the remedy to (1) limit interior dust cleanup to attics with an obvious exposure pathway (either frequent resident access to and use of the attic, or ceiling or other barriers to the attic that are in disrepair), and (2) address interior dust contamination (in portions of homes other than the attic) through a comprehensive health and education program rather than sampling and remediation which is currently being implemented through the ADLC CPMP. All other components of the original remedy were unchanged.

4.0 Basis for and Description of Significant Differences

Following the issuance of the 2017 ESD, ATSDR conducted an exposure investigation in Anaconda in 2018 and submitted a report with their findings and recommendations which is the first basis of change to the Community Soils OU remedy. These findings and conclusions are described below.

Although the 1996 Community Soils OU ROD identified the potential for contingency measures if the IC programs fail to achieve remedial requirements, it did not recognize that alternative ICs could be implemented by parties other than ADLC. This contingency is further described below and forms the second basis for the change to the Community Soils OU remedy.

4.1 Significant Difference #1 – Expand Attic Dust Cleanup through a Comprehensive Attic Dust Abatement Program

In the fall of 2018, ATSDR, in coordination with the Montana Department of Public Health and Human Services, conducted an Exposure Investigation (EI) in Anaconda, Montana to assess lead and arsenic exposure. ATSDR tested a total of 367 people during two sampling events in September and November of 2018.

The ATSDR EI team collected blood (lead) and urine (arsenic) samples from participants living within the Anaconda community. Although all members of the community were invited to participate in the EI, the populations most vulnerable to the effects of lead include young children with hand-to-mouth behavior (especially children with pica behavior) and women who are pregnant or of childbearing age.

ATSDR tested 191 participants in September 2018. Community interest was high, and approximately 150 residents were placed on a wait list. ATSDR tested 177 people in November 2018 to accommodate the wait-listed residents. For the November event, ATSDR reached out to Head Start and Anaconda preschools and elementary schools to recruit additional young children and women of childbearing age. The total sample population was 367 people over both events (one person was tested in both events). The following are conclusions and recommendations provided in the ATSDR EI final report.

Exposure Investigation (EI) Conclusions

• The overall conclusion of the EI is that levels of blood lead and urinary arsenic measured in residents of Anaconda that participated in the EI are comparable to the U.S. population, as reported in the National Health and Nutrition Examination Survey (NHANES).
• All 18 children younger than 6 years old who participated in the testing events measured a blood lead level (BLL) below the 5 microgram per deciliter (µg/dL) follow-up level.

• The median BLL for all EI participants was approximately 0.15 µg/dL higher than the U.S. median, but this difference is not clinically significant.
• For arsenic, Anaconda EI participants had a slight elevation in total urinary arsenic (approximately 0.9 µg/gm Cr higher) compared to NHANES participants. The elevation in total arsenic, however, appears to be attributable to organic arsenic given that the level of inorganic arsenic was slightly lower (0.2 µg/gm Cr) than comparable NHANES values. Organic arsenic enters the body through diet and is not toxic at these levels. The organic arsenic testing results correlated to participants who reported eating foods high in organic arsenic. ATSDR would not anticipate health effects associated with urine arsenic levels measured in the Anaconda participants.
• Evaluation of the questionnaire administered at the time of the testing suggests that people can take measures to further reduce their exposure to lead. The analysis of questionnaire data in relation to BLL indicates that people who reported working in construction and maintenance jobs had higher BLLs.
• Many Anaconda attics are contaminated with lead and arsenic as a result of smelter activities in the past. Participants who reported entering their attics on a regular basis generally had higher BLL and total arsenic than other participants.
• The EI results do not mean that the risk of exposure to lead and arsenic in Anaconda has been eliminated; residents should continue to be proactive in preventing exposure.

Exposure Investigation (EI) Recommendations

ATSDR identified specific actions, consistent with prudent public health practice that may further reduce the risk of lead and arsenic exposures in Anaconda residents. The ATSDR report recommends primary prevention efforts to avoid exposure to lead and arsenic in soil. ATSDR supports the following recommendations and public health actions.

• Anaconda citizens (including landlords) should participate in the Superfund Community Soils OU residential yard and attic clean-up programs as a primary mechanism for reducing potential exposure to lead and arsenic. Through the Superfund program (funded by AR with EPA oversight), residents may opt for soil and attic testing. Based on the results, residents can qualify for a contractor to clean contaminated attics. EPA and ADLC should make efforts to increase participation in these programs. In the meantime, ATSDR recommends that residents minimize time (or seal entryway) in untested or contaminated (but not yet remediated) attics.
• Anaconda citizens should take prudent actions to avoid contact with potentially contaminated soil. These actions include:
o Avoid areas of known contamination (e.g., slag piles) and instruct children not to play or ride bikes there;
o Supervise children closely to modify or eliminate risky hand-to-mouth behaviors or intentional eating of dirt (pica behavior);
o Damp mop and damp dust surfaces;

o Cover bare soils with vegetation (grass, mulch, etc.) and create safe play areas for children with clean ground cover;

o Remove shoes before entering the home;

o Bathe pets regularly to avoid them tracking contaminated soil into homes.

• Anaconda citizens should take precautions to prevent exposure to lead from lead paint during house renovations in homes built prior to 1978. Information is available at: https://www.epa.gov/lead/protect-your-family-lead-your-home.

• The EPA and AR should minimize risk of exposure to lead and arsenic from uncovered slag through improved signage (specifically uncapped slag piles) and Superfund remedial actions.

• The ALDC Health Department should conduct regular BLL screenings for children under age 6 based on risk identified from site contamination and the American Academy of Pediatrics (AAP) recommendation [AAP, 2016] of regular BLL screenings for communities with a significant portion of homes built before 1960. Ensure venous draws and physician follow-up for capillary BLL at or above the CDC Reference value of 5 µg/dL.

• Primary healthcare providers should continue to improve understanding of lead screening and ways to reduce exposure to site contaminants and lead paint. The ATSDR's Case Studies in Environmental Medicine (CSEM) provide a self-instructional primer. The lead and arsenic CSEMs are available at: https://www.atsdr.cdc.gov/csem/csem.asp?csem=34&po=0 https://www.atsdr.cdc.gov/csem/csem.asp?csem=1&po=0

• People working in jobs where lead and arsenic are present should use appropriate personal protective equipment (PPE) while on the job to reduce exposure. Regular hand washing and removing outer garments before entering the home after work reduces exposures and protects family members.

ADLC working with AR have developed a comprehensive long-term attic dust abatement program that would provide for attic dust cleanup beyond what is identified in the current Community Soils Operable Unit Remedial Action Work Plan/Final Design Report (CSOU RAWP/FDR). This program is available for residential attics where the following two criteria are met: (1) the home was constructed prior to 1980 and (2) sampling confirms that lead or arsenic concentrations in the attic dust exceed their respective action levels. Under this program, eligible residential attics with an obvious exposure pathway (as defined above) will be prioritized for remediation. Other residential attics not used as living space or without an obvious exposure pathway may also be eligible for remediation by ADLC under an agreement to be entered into with AR. The ADLC program is intended to be available for a period of 25 years.

EPA believes that addressing attic dust contamination through a long-term comprehensive abatement program, along with the county's other institutional controls programs, will better address exposure to attic dust contamination at the Site and further protect human health at the Site.

4.2 Significant Difference #2 – Providing Alternate Institutional Control Programs to support the remedy in the event that Anaconda-Deer Lodge County is unable to perform their IC programs.

Remedial requirements for ICs in the 1996 Community Soils OU ROD and its subsequent ROD amendments include:

- *Assure that future land use at the site is consistent with EPA's determination of health and environmental risk posed by contaminants at the site.*

- *Provide for the preservation and maintenance of Superfund remedial structures on the site, including but not limited to caps, berms, waste repositories and vegetated areas.*

- *Require that future development at the site employs construction practices that are consistent with the protection of public health and the environment, as determined by Superfund remedial actions.*

- *Remedy, as development occurs at the site, soil arsenic (and lead) concentrations to levels appropriate for the intended use, as determined by Superfund remedial actions.*

- *Provide for implementation of other laws applicable to development, such as subdivision and floodplain requirements.*

- *Take "additional measures" if the ADLC ICs program is not fully effective in monitoring and protecting the implemented remedy.*

The remedy to achieve these remedial requirements is identified in various IC programs currently being implemented through the DPS and CPMP as described above. The 1996 Community Soils ROD and subsequent ROD amendments assumed that these ICs would be implemented by ADLC. In developing a site-wide institutional controls implementation and assurance plan, EPA, in consultation with DEQ, has identified the following alternate ICs to be implemented by parties other than ADLC as the "additional measures" required pursuant to the ROD in the event that ADLC fails or stops implementing the DPS and other primary ICs programs. They include:

- Materials Handling Program. This would allow for continued delivery of the services currently provided under the DPS for identifying, tracking, and assisting with certain development projects within the Superfund Overlay. These would include: education and outreach; monitoring of a public notification process for development projects (such as 811 "call-before-you-dig"); an element in the Geographic Information System mention below for tracking development projects; pre-development and post-development sampling; instruction on appropriate measures for soil removal, treatment, or covering; and protection or

replacement of existing protective covers and storm water controls within a proposed development area;

- Domestic Well Program. This program would identify, track, and assist with the drilling and use of new domestic wells and the replacement or conversion of existing wells for drinking water use within the Superfund Domestic Well Overlay. Eligible wells would be identified through education of well drillers, 811 "call-before-you-dig" services, and public education. Eligible wells would be sampled in accordance with the Domestic Well Monitoring Plan. Sampling results would be used to determine what additional remedial action should be done, as specified in the Domestic Well Monitoring Plan. Designation and enforcement of a Controlled Groundwater Area by the Montana DNRC (under Mont. Code Ann. §§ 85-2-501 et seq.) could be used instead of or in addition to the domestic well program described above.

- Interior Dust Program. This program would be unchanged from that outlined in the 2017 ESD. It would include education; cleaning, hygiene, and recommendations and diet guidance; HEPA Vacuum Cleaner Loaner Program Renovation Starter Kits; and home inspections.

- Community Protective Measures Program. This would provide for a health education program to inform residents within the Superfund Overlay of the potential risks to arsenic and lead and recommendations for reducing exposure to lead; track information and data on arsenic and lead concentrations/locations in a data base/GIS for public access to be used by regulators, prospective home buyers, lenders, contractors, and others; and prior to soil remediation, coordinate with landowners so they have the opportunity to address deteriorating exterior lead paint from homes/garages/fences that may have the potential to re-contaminate remediated soil areas.
    - Soil Swap Program. Currently an element of the CPMP, this would provide for removing soil from certain vegetable gardens, designated play areas, or excavation areas, and replacing it with clean soil.

EPA will allow the performing entity(ies) a reasonable period of time to implement the alternate ICs and demonstrate that they effectively protect the remedy. No other ICs or additional measures will be required beyond the alternate ICs described above unless EPA, in consultation with DEQ determines the alternate ICs are not protective regardless of the entity(ies) responsible for implementation.

Both the current and alternate IC programs will be updated into a site-wide institutional control implementation and assurance plan. EPA maintains the authority under CERCLA and the 1996 Community Soils OU ROD to require additional contingency measures if

ICs (implemented by ADLC and/or other parties) are failing to protect an engineered remedy or human health or the environment.

5.0 Additional Minor Changes

In addition to the two significant differences discussed above, additional minor changes are necessary. A summary of the minor changes is presented below.

5.1 Residential Yard Soils

A residential yard is defined as a maximum of 125 feet from the exterior of a residence, unless a property or natural boundary (i.e., fence, hedge, tree line, abrupt change in grade, etc.) is encountered at a distance less than 125 feet. The appropriate action level for a given parcel will be dictated by its current land use, which use must be consistent with applicable zoning requirements and covenants. The only exceptions to this definition will be specifically identified in the final CSOU RAWP.

Consistent with the *Superfund Lead-Contaminated Residential Sites Handbook* (EPA, 2003a), RA decisions applicable to removing soils with arsenic concentrations $\geq$ 250 ppm, will be based on a residential yard component basis (e.g. front yard, back yard, garden, etc.) rather than the area-weighted average concentration for the property. This minor change is being made to simplify RA decisions and because of past confusion about how the sampling results were being interpreted and applied. Samples will be collected at the 0 to 6-inch and 6 to 12-inch depth intervals. Vegetable and flower gardens are the only yard components that will be sampled deeper than 12 inches.

Reasonable efforts will be used to remove visible mining and smelting-related waste (Miscellaneous Waste) encountered while performing RA in a residential yard. To the extent practicable, Miscellaneous Waste removal will extend laterally and vertically within the residential yard until an existing barrier is encountered (e.g., concrete sidewalk, building foundation, driveway, tree roots, asphalt pavement, underground utility line, etc.). Excavation of Miscellaneous Waste will not require the removal or disturbance of existing barriers, excavation below those barriers, or excavation deeper than the maximum safe reach of the excavation equipment.

5.2 Commercial/Industrial Soils and Unpaved Parking Lots

The commercial/industrial action level of 500 ppm arsenic shall apply to all commercial/industrial soils and unpaved parking lots within the community of Anaconda. Commercial/industrial and unpaved alleys/parking lots outside the community of Anaconda will be or have been addressed under the Anaconda Regional Water, Waste and Soils OU or Old Works/East Anaconda Development Area OU.

Similar to the logic used in residential yards, sampling and remedial action for commercial/industrial soils will be limited to the 0 to 6-inch and 6 to 12-inch depth

intervals. Any portion of a commercial/industrial parcel or parking lot with an existing cap (e.g. concrete, asphalt, etc.) will not be eligible for sampling or remedial action.

Any visible mining and smelting-related waste (Miscellaneous Waste) encountered while performing RA within a commercial/industrial area or unpaved parking lot will be removed to a maximum depth of 12 inches. To the extent practicable, Miscellaneous Waste removal will extend laterally until a property boundary or an existing barrier is encountered (e.g., concrete sidewalk or foundation, tree roots, asphalt pavement, etc.).

5.3 Unpaved Alleys

The residential action level of 250 ppm arsenic and/or 400 ppm lead will apply to all unpaved alleys within the community of Anaconda that have not already been remediated or are being addressed under a separate Anaconda Smelter NPL Site OU. Remedial action decisions applicable to soils $\geq$ 250 ppm Arsenic and/or 400 ppm lead will be based on a component specific basis (e.g. alley, etc.).

Sampling and remedial action for previously unsampled unpaved alleys and parking lots will be limited to the 0 to 6-inch interval. Alleys are well compacted with infrequent exposure by residents and are unlikely to be excavated by hand tools by residents to a depth beyond 6 inches. Additionally, a General Utility and Services (GUS) permit is required for excavations in alleys by ADLC personnel and contractors; consequently, potential exposure to deeper soils in alleys will be addressed through excavation ICs. All alleys with an existing cap (e.g. concrete, asphalt, etc.) or that were previously remediated will not be subject to further sampling or remediation.

6.0 Support Agency Comments

The Montana Department of Environmental Quality concurs with these remedy changes.

7.0 Statutory Determinations

EPA has determined that the Community Soils OU remedy, as modified by the changes described herein, is protective of human health and the environment, complies with all federal and state requirements that are applicable or relevant and appropriate to this remedial action, meets the remedial action objectives, is cost effective, utilizes permanent solutions and alternative technologies to the extent practicable, and satisfies the requirements in section 121 of CERCLA.

The remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. However, contaminated soils present at the Community Soils OU do not represent a principal threat, and treatment would be significantly more expensive due to the very large quantities of materials impacted. Although they are present in large volumes, the soils within the Community Soils OU are low in toxicity and can be reliably contained.

Because implemented remedies have resulted in mining/smelting contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure at the Site, statutory five-year reviews have been initiated at the Site and will continue to ensure that remedies remain protective of human health and the environment. The five-year reviews will continue to focus on areas where waste has been left in place or where remaining concentrations do not allow for unlimited use of the property.

8.0 Public Participation Process

A formal public comment period is not required for an ESD. EPA will publish a notice of availability and a brief description of the ESD in the *Anaconda Leader* and *Montana Standard* (as required by Code of Federal Regulation 40, Section 300.435(c)(2)(i)(B). This ESD and supporting documents will become a part of the Community Soils OU Administrative Record file and information repository (as required by CFR 40, Section 300.435(c)(2)(i)(A) and 300.825(a)(2)).

BETSY SMIDINGER

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Date: 2020.06.12 09:37:59 -06'00'

Betsy Smidinger
Director
Superfund and Emergency Management Division
US EPA Region 8

Date