

From: [John Peterson](#)
To: [Dhont, Jeffrey](#)
Cc: [Mike Gronseth](#); [John Peterson](#)
Subject: Iron King Mine/Humboldt Smelter FS
Date: Wednesday, May 12, 2021 11:10:55 AM
Attachments: [Ikhs_adeq_comments_draft IKHS_FS_12_may_2021.pdf](#)

Jeff,

ADEQ and our contractor Matrix Environmental Services, LLC reviewed the following document prepared by Tetra Tech for the U.S. Environmental Protection Agency, Region 9:

- *Draft Feasibility Study, Iron King Mine / Humboldt Smelter Superfund Site, March 2021.*

ADEQ comments on the above referenced document are included in the attached PDF. Please contact me if you have any questions. Thanks.

ADEQ may add or amend ADEQ comments if evidence to the contrary of our understanding is discovered; if received information is determined to be inaccurate; if any condition was unknown to ADEQ at the time this document was signed or electronically delivered; if other parties bring valid and proven concerns to our attention; or site conditions are deemed not protective of human health and the environment within the scope of this Department.

John R. Peterson

Project Manager, Federal Projects Unit
Waste Programs Division
Ph: 602-771-2234



azdeq.gov

Your feedback matters to ADEQ. Visit azdeq.gov/feedback



Douglas A. Ducey
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY



Misael Cabrera
Director

May 12, 2021
FPU 21-276

Mr. Jeffrey A. Dhont
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street Mail Stop SFD-6-2
San Francisco, CA 94105

Re: *Draft Feasibility Study, Iron King Mine – Humboldt Smelter Superfund Site, March 2021.*

Dear Mr. Dhont:

The Arizona Department of Environmental Quality (ADEQ) reviewed the above-referenced document and has the following comments:

General Comments:

1. Overall the document is well written and presents remedial alternatives that are consistent with and have been successfully implemented at other similar abandoned mine sites.
2. Acronyms and Abbreviations. There are several acronyms or abbreviations included in the text that are not included in the list of acronyms (i.e. PbS, ZnFeS) please review and revise accordingly.
3. Acronyms and Abbreviations. Please revise Arizona Department of State Lands to Arizona State Land Department and its corresponding acronym to ASLD.
4. Acronyms and Abbreviations. The acronym for the Unified Soil Classification System is defined as UCSC. Please revise to USCS.
5. Acronyms and Abbreviations. There are several instances where an acronym is defined multiple times within the document (i.e. MW, NCP). Please consider using the acronym only following first usage.
6. Due to the length and complexity of this document, please consider adding an executive summary.
7. The document is confusing as written relative to groundwater. For example, Section 1.4 lists shallow groundwater as a media of concern and Section 1.6.1 lists groundwater as a point of exposure to human receptors. Section 1.8 does not include ARARs for groundwater. Please add text to Section 1.8 clarifying why ARARs were not developed for groundwater.
8. There are several references to tables and figures from the remedial investigation. To provide a complete FS, please include the referenced tables and figures in an appendix.

Main Office

1110 W. Washington Street • Phoenix, AZ 85007
(602) 771-2300

Southern Regional Office

400 W. Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733

www.azdeq.gov
printed on recycled paper

Specific Comments:

1. **Section 1.2.2, Page 8, Third Paragraph, First Sentence.** The text reads "...hillside above the Agua Fria River (see below)." The reference to "see below" is unclear. If the intent is to direct the reader to the paragraphs in the section beginning with the header "Humboldt Smelter Property" please revise the text to read "...hillside above the Agua Fria River (see Humboldt Smelter Property below)."
2. **Section 1.2.2, Page 8, Third Paragraph, Second Sentence.** The text reads "...hundreds more workers (see below)." The reference to "see below" is unclear. If the intent is to direct the reader to the paragraphs in the section beginning with the header "Humboldt Smelter Property" please revise the text to read "...hundreds more workers (see Humboldt Smelter Property below)."
3. **Section 1.2.2, Page 8, Third Paragraph, Second Sentence.** The text reads "In about 1905 the Arizona Metals Company..." The text in the "Humboldt Smelter Property" portion of Section 1.2.2 references the Arizona Smelting Company and Consolidated Arizona Metals. Please review and clarify the correct name of the Arizona Metals Company.
4. **Section 1.2.2, Page 9, 3rd Paragraph, Second Sentence.** change World War 1 to World War 2.
5. **Section 1.2.2, Page 10, Fifth Paragraph, First Sentence.** The text states that Figure 1-2 shows possible locations of two possible human burial sites beside the MTP. Please add the sites to Figure 1-2 or modify the sentence.
6. **Section 1.2.2, Page 10, Sixth Paragraph, Second Sentence.** Please revise the text to read "Figure 1-10 provides an abbreviated chronology and history of the *Humboldt Smelter operations*."
7. **Section 1.2.3, Page 12, Second Paragraph, 1st sentence.** Change State Department of Lands to Arizona State Land Department (ASLD). Please make this change throughout the document.
8. **Section 1.2.3, Page 13, Last Paragraph.** The paragraph presents community concern over the potential for coke and coking wastes. Please provide a summary of the results of the supplemental investigation and a reference to Appendix G-6. Also consider including text relative to the ability of the alternatives evaluated to address coking wastes IF they are encountered during the excavation activities within the Humboldt Smelter property.
9. **Section 2.0, Page 29, First Paragraph, First Sentence.** The text reads "The following sections present the following: (1) RAOs for contaminated solids (including tailings, soils, waste rock, dross, and slag), groundwater, surface water..." RAOs for groundwater are not included in the section please add.
10. **Section 2.1, Page 29, Third Paragraph.** The text reads "Site-specific RAOs for solid source media (including wastes (tailings, waste rock dross, and slag) and soils are to:" Please remove the orphan parenthesis.
11. **Section 2.1, Page 30, Item 6.** The physical risks associated with the open adits and shafts should also be included in the section.

12. **Section 2.3.2, Page 32, First Paragraph, First Bullet.** The list of COCs for the residential receptor includes cobalt. The list of COCs presented in Table 2-3 does not include cobalt. Please review and revise the text to correct this discrepancy.

13. **Section 2.3.3, Page 34, Second paragraph, First sentence.** Should this be Galena Gulch and not Chaparral Gulch?

14. **Section 2.3.3, Page 34, Last Paragraph.** The text reads “The supplemental human health risk evaluation for AOC 12 (Appendix C-3) showed that the risk to a residential human receptor is 3E-05. AOC 12 was removed from further consideration in this FS for remedial actions because the area did not present a residential human health risk above the risk management range of 10-4 to 10-6.” Based on the values presented, AOC 12 should not be removed from the FS given that risk to a residential receptor is within the risk management range of 10-4 to 10-6.

15. **Section 2.4.1, Page 37, Last Bullet.** It is acknowledged that ambient air is not a media of concern in general at the site. However, ambient air could become an issue if particulates are generated during remedial action. Please add text indicating limits that may be triggered during the RA.

16. **Section 2.4.3, Page 38, Fourth sentence.** Should AOC 7b be AOC 7? Also, the text states that both AOCs 7 and 12 were removed from consideration for remedial action in this FS which conflicts with Section 2.3.3 where AOC 7 was retained and only AOC 12 was removed from consideration. See Comment 14.

17. **Section 3.2.1, Page 42, First Paragraph, Last Sentence.** Please correct the acronym for the Unified Soil Classification System from UCSC to USCS.

18. **Section 3.2.6, Page 48, Second Paragraph, First Sentence.** The sentence reads “In the technical memorandum, five potential on-site mine waste repository locations were evaluated for capacity (Figure 3-3). The reference figure presents only three locations. Please revise to show all repository locations that were considered.

19. **Section 3.2.6, Page 48, Third Paragraph, Third Sentence.** The sentence reads “Table 3-5 lists capacities of the repositories on the east and west sides of Highway 69.” The table is inconsistent with the number of repository locations presented in Figure 3-3 (3). Please review all references and revise for consistency.

20. **Section 3.2.7, Page 51, Second paragraph.** Change Agra Fria to Agua Fria.

21. **Section 3.3, Page 52.** Although chemical constituents are the primary concern at the site. Physical hazards are also present due to open mine works. The FS must address these physical hazards as well as the chemical hazards noted.

22. **Section 3.3.1, Page 52, First Paragraph, Third sentence.** Fencing has been listed as a potentially applicable IC for the site. ICs typically are a variety of administrative or legal devices (e.g., use control areas, deed restrictions/notices, covenants) imposed to ensure that engineering controls stay in place or, where there are no engineering controls, to ensure the restrictions on land use stay in place. Recommend deleting fencing from this section as it is correctly referenced in Section 3.3.2.1.

23. **Section 3.3.2.2, Page 54, Second paragraph, Fourth Sentence.** The text states *Other uncontaminated waste sources*, please verify.
24. **Section 3.3.3.1, Page 56, Second Paragraph, First Sentence.** Should tailings dam be changed to Chaparral Gulch Dam?
25. **Section 3.3.3.1, Page 58, Fourth Paragraph, Last Two Sentences.** The text states...*during and following remediation, water in Chaparral Gulch would require treatment to remove dissolved metals.* Please verify.
26. **Section 4.3.1, Page 70, First paragraph, last sentence.** Have Figures 4-3 and Figure 4-4 been switched? Additionally, please check references to Figures 4-2 through 4-5 in Section 4.3.2.1 and Section 4.3.3.
27. **Section 4.3.2.1, Page 70, First Paragraph, Second sentence.** The text reads “At the conclusion of the remedial action, the repository, with the existing 5 million CY of tailing and...” In other sections of the FS, this volume is presented as 4.3 million CY. Please review and confirm the correct volume.
28. **Section 4.4.2.2, Page 82, First Paragraph, Second Sentence.** The text reads “Waste placed in the repository would be contoured to meet a specific design purpose and...” Please add text to clarify the “specific design purpose”.
29. **Section 4.5.2.2, Page 91, Second Paragraph, Second Sentence.** The text reads “Waste placed in the repository would be contoured to meet a specific design purpose and...” Please add text to clarify the “specific design purpose”.
30. **Section 5.3.1, Page 114, Second Paragraph, First Sentence.** Please revise the text as follows: “Alternative 2 would include...”
31. **Section 5.3.2.2, Page 117, First Paragraph First Sentence.** The text refers to Executive Order 13788. The referenced EO is Buy American, Hire American. It appears that the EO 13778 should be referenced. Please confirm. Also note, EO 13778 may have been revoked by EO 13990. Please review EO 13990 to confirm that the application of EO13778 is still applicable to this FS.
32. **Section 5.3.2.3, Page 119, Third Paragraph, Fifth Sentence.** Please revise the text to read “As RCRA is a delegable program *to* the states...”
33. **Section 5.3.2.3, Page 119, Third Paragraph, Sixth Sentence.** Please revise the text to read “...pertaining to construction *of* new temporary units...”
34. **Section 5.3.3.2, Page 122, Solid Source Media RAOs 3, 4, and 5, Last Paragraph.** The text indicates that Alternative 2 would attain RAOs 3 and 4. The text also indicates that the waste would no longer be subject to wind entrainment. This text would suggest that RAO 5 is also attained. Please review and revise accordingly.
35. **Section 5.3.6.1, Page 126, First Paragraph First Sentence.** Please revise the text to read “...as with all alternatives other than No Action...”

36. For Alternatives 2 (**Section 5.3.6.1, Page 127, Last Paragraph**) and 3A/3B (**Section 5.4.6.1, page 144, Last Paragraph**) under Technical Feasibility, see the following sentence. *The pitch of the existing repository slopes would be reduced and repository side slopes would be benched, allowing the repository operator to remove benches in layers and make repairs.* Please make it clear that the repository operator is not North American Industries but the entity that will be maintaining the repositories.

37. For Alternatives 2, 3A/3B, and 4 under Administrative Feasibility (**Pages 128, 145, and 158, respectively**), see the following sentence. *When addressing the monolithic slag, USACE and ADEQ would review and approve designs for stream diversions, and ADEQ would oversee the construction and restoration process. Also, excavation would affect some wetlands upstream of the dam (see Figure 1-18). USACE and ADEQ would review and approve designs for wetland modification, and ADEQ would oversee the construction and restoration process.* Should ADEQ be cited here? Please check to see if EPA would remain in oversight mode of the construction and restoration, with ADEQ present to advise regarding state requirements or if there may be other arrangements.

38. **Section 5.4.2.1, Page 131, First Paragraph, Fifth Sentence.** The text reads “Alternatively, the contract specifications may require confirmation sampling to estimate when chemical concentrations satisfy site-specific cleanup goals.” Generally, confirmation sampling is performed to confirm that wastes have been removed to concentrations below target levels. Please revise the text to indicate that contract specifications will require confirmation sampling.

39. **Section 5.4.2.2, Page 132, Third Paragraph, First Sentence.** The text refers to Executive Order 13788. The referenced EO is Buy American, Hire American. It appears that the EO 13778 should be referenced. Please confirm. Also note, EO 13778 may have been revoked by EO 13990. Please review EO 13990 to confirm that the application of EO13778 is still applicable to this FS.

40. **Section 5.4.2.3, Page 135, First Full Paragraph, Fifth Sentence.** Please revise the text to read “As RCRA is a delegable program to the states...”

41. **Section 5.4.3.2, Page 138, Solid Source Media RAOs 3, 4, and 5, Last Paragraph.** The text indicates that Alternatives 3A/3B would attain RAOs 3 and 4. The text also indicates that the waste would no longer be subject to wind entrainment. This text would suggest that RAO 5 is also attained. Please review and revise accordingly.

42. **Section 5.4.6.1, Page 143, Second Paragraph, First Sentence.** The text presents the anticipated acreages of the covers for the two repositories. The acreages listed do not appear to include the cover at the Main Tailings Pile. Please review and revise as needed.

43. **Section 5.5.2.1, Page 148, First paragraph, Fifth Sentence.** The text reads “Alternatively, the contract specifications may require confirmation sampling to estimate when chemical concentrations satisfy site-specific cleanup goals.” Generally, confirmation sampling is performed to confirm that wastes have been removed to concentrations below target levels. Please revise the text to indicate that contract specifications will require confirmation sampling.

44. **Section 5.5.2.2, Page 149, Third Paragraph, First Sentence.** The text refers to Executive Order 13788. The referenced EO is Buy American, Hire American. It appears that the EO 13778 should be

referenced. Please confirm. Also note, EO 13778 may have been revoked by EO 13990. Please review EO 13990 to confirm that the application of EO13778 is still applicable to this FS.

45. **Section 5.5.3.2, Page 153, Solid Source Media RAOs 3, 4, and 5, Last Paragraph.** The text indicates that Alternatives 4 would attain RAOs 3 and 4. The text also indicates that the waste would no longer be subject to wind entrainment. This text would suggest that RAO 5 is also attained. Please review and revise accordingly.

46. **Section 6.7.2, Page 175, Second Paragraph, First Sentence.** Change *no potential were* to *no potential would*.

47. **Section 6.7.3, Page 176, Second paragraph, Third Sentence.** Replace *shorted* with *shortest*.

48. **Page E-10, under Housing Compensation.** Please remove the reference to Alternative 5.

49. **Figure 1-2.** Add locations of burial sites. Correct location of Iron King Rd label.

50. **Figure 2-1.** The Legend is incomplete.

51. **Figure 3-2.** Should EPA Chaparral Gulch Gaging Station be on the figure?

52. **Figure 4-1.** The figure indicates that monitored natural recovery would be implemented in the Agua Fria River downstream of Lower Chaparral Gulch. Given the calving of monolithic slag into the Agua Fria River, please provide an explanation for not extending MNR along the entire eastern flank of the site.

53. **Figure 4-3.** Revise caption beneath figure to reference the Main Tailings Pile and not the Iron King Smelter. Also, in Legend revise Mine Tailings Pile to Main Tailings Pile.

54. **Table 3-7.** Please include process options to address open mine works (i.e., adits and shafts).

55. **Table 3-7.** Since groundwater is addressed in the alternatives, please provide process option for groundwater to the Aqueous Media section of the table.

56. **Table 3-8.** Please indicate that Aqueous Media also includes groundwater.

57. **Table 4-1.** Please indicate that Aqueous Media also includes groundwater.

58. **Tables 5-4 through 5-7.** There are inconsistencies between the tables and text relative to costs. Please review and revise accordingly.

59. **Table 6-1, Page 1 of 3, Last row.** Please revise the text to read "Alternatives 2 – 4 are equal for this..."

60. **Table 6-1, Page 3 of 3.** The cost presented do not match the values presented in tables 5-4 through 5-7. Please review and revise accordingly.

61. **Table 6-2.** Please confirm cost values with Tables 5-4 through 5-7.

If you have any questions or need additional information, please contact me at 602-771-2234 or peterson.john@azdeq.gov.

Sincerely,

A handwritten signature in black ink that reads "John R. Peterson". The signature is written in a cursive style with a large initial "J".

John R. Peterson
Project Manager
Federal Projects Unit

cc: Mike Gronseth, Matrix Design Group