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| Review of the December 14, 2017 (Draft) Baseline Ecological Risk Assessment Former Manufacturing Plant (FMP) Area Sherwin-Williams/Hilliards Creek Superfund Site – Operable Unit 2 (Soils)<br>Administrative Order Index No. II CERCLA-02-99-2035 | | |
| **Text Comments** | | |
| 1 | Executive Summary, page ES-2: In the first full paragraph, please revise the last sentence to indicate that dietary doses used site-specific benthic and terrestrial invertebrate and fish tissue concentrations, rather than modeled tissue concentrations. | The text has been revised to: "Dietary doses were estimated using site-specific benthic and terrestrial invertebrate and fish tissue and modeled plant tissue concentrations, as well as available information on biological and life history, including body weight, feeding behavior, site usage, and diet." |
| 2 | Executive Summary, Benthic Invertebrates, page ES-2: The primary COPCs of arsenic, cyanide and lead should be mentioned in the first bullet regarding benthic invertebrates, as they are presented as primary COPCs on Table 8 Weight-of-Evidence Analysis for Benthic Invertebrates. | The following text has been added to the Benthic Invertebrate bullet on page ES-2: "As, CN-, and Pb in UHC were identified as primary COPCs for benthic invertebrates." |
| 3 | Section 2.4 Ecological Receptor Groups, page 5: As the raccoon is evaluated for both aquatic and terrestrial exposures in the SLERA and also in Appendix D of the BERA, the text should be revised to include the raccoon under both the aquatic and terrestrial-dependent wildlife lists. | The text has been revised to include the raccoon in both the terrestrial and aquatic-dependent wildlife receptor lists. Figure 4, the FMP Area Conceptual Site Model, has also been updated to include the raccoon in both the aquatic and terrestrial wildlife receptors lists. |
| 4 | Section 2.7 Measurement Endpoints and Risk Questions, page 8: The first complete sentence on page 8 should be revised to indicate “FMP BERA” instead of "Burn Site BERA." The text should be reviewed and revised for other instances where this occurs throughout the document. | The text in Section 2.7 (page 8), has been corrected from "Burn Site BERA" to "FMP Area BERA." The text in Section 5 (page 28) and Section 8.2.3 (page 51), was also corrected from "Burn Site BERA" to "FMP Area BERA." |
| 5 | Section 4.2.8 Weight-of-Evidence Conclusions, page 26: The first conclusion bullet indicates only one location had an mPECQ > 1.0 for metals ("HCBEDD18"). However, as noted in Appendix C, Table C.2 that there are four other locations where the mPECQ is greater than 1.0: samples collected in 2005 from "HCDD0035," HCDD0036, HCDD0037 and in 2006 from HCDD00100. In addition, there are exceedances for PAHs and PCBs as well in Tables C.4 and C.5. The text should be revised to include this information. | The weight-of-evidence (WOE) evaluation presented in this section relies primarily on the 2017 dataset, which includes co-located sediment chemistry and toxicity test data that were collected using an approved BERA Work Plan. By comparison, the older sediment chemistry data presented in Table C.2 do not have matching sediment toxicity.<br><br>In response to EPA's comment, the text has been edited to include a description of benchmark exceedances in historical sediment data and benchmark exceedances of PAHs and PCBs in the 2017 sediment dataset. |

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| 6 | Section 7.2.2 Earthworm Tissue Chemistry, page 38: The text indicates that most organic COPCs were undetected in earthworm tissue, however there are numerous elevated detection limits for inorganic and organic constituents (Table B.6 UHC Soil Invertebrate Tissue Summary Statistics). This should be discussed in the first bullet, Exposure Estimates, in Section 7.2.3 Uncertainty Analysis. | A comparison of earthworm tissue concentrations to critical body residue (CBRs) was not conducted in the BERA due to a lack of consensus toxicity data (see Section 7.1.2). As a result, the detection limits for earthworm tissues cannot be compared to CBRs to evaluate whether they are elevated or not.<br><br>In response to EPA's comment, we added additional language to Section 7.2.3 to indicate that exposure and risk estimates for earthworm tissues may have been over- or underestimated for COPCs with limited detections. |
| 7 | Section 7.2.3 Uncertainty Analysis, Bioavailability, page 38: As this section provides a summary of soil invertebrate tissue collected at the FMP area rather than the results of modeling to soil invertebrate, it is unclear why uncertainty regarding bioavailability is of concern. This information should be deleted from the report. | The text regarding bioavailability in Section 7.2.3 has been removed from the report. |
| 8 | Section 8.2.3 Uncertainty Analysis, AUFs, page 49: The discussion of AUFs should note that cyanide posed a risk to the red-tailed hawk based upon an AUF of "1" rather than "0.1." | The text in Section 8.2.3 is correct. Appendix D, Table D.7 shows a NOAEL-based HQ of 6, based on an AUF of 0.1 for the Red-Tailed Hawk. Report Table 13 shows no risk to the Red-Tailed Hawk from CN- using an AUF of 0.1 for the LOAEL-based HQ. Text has been added to clarify the discussion of AUFs in Section 8.2.3. |
| 9 | Section 8.2.3 Uncertainty Analysis, TRVs, Cyanide, page 50: Cyanide toxicity to birds from exposure at gold mining sites is well-documented in the scientific literature. See attached list of references ("Cyanide References"). | The references cited by EPA contain similar acute avian toxicity data for CN- and no new chronic toxicity data. Specifically, acute oral median lethal doses ($LD_{50}$) of between 2.7 and 21 mg CN-/kg-bw are reported in the references cited by EPA. The chronic avian TRV for CN- used in the BERA (0.04 mg cyanide/kg-day) is based on an acute $LD_{50}$ value for the kestrel (4 mg cyanide/kg-bw), which is presented in the references cited by EPA, and falls within the range of acute toxicity values contained within the references cited by EPA (*i.e.*, 2.7 to 21 mg CN-/kg-bw).<br><br>The source of uncertainty with CN-'s avian TRV, identified in Section 8.2.3 of this BERA, is that the TRV is based on an acute $LD_{50}$ value and therefore applies a large uncertainty factor of 100, not that there is a lack of acute cyanide toxicity data available for birds. The text has been edited to further clarify this point. |
| 10 | Section 8.2.3 Uncertainty Analysis, Risk Estimates for Amphibians and Reptiles, page 51: The last sentence should be revised to indicate "FMP Site" instead of "Burn Site." | The text has been revised (see response to EPA comment #4). |

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| 11 | Section 8.2.3 Uncertainty Analysis, Risk Estimates for Bald Eagle, page 51: The Great Blue Heron had an HQ >1 based on the NOAEL for Pb, not the LOAEL. Please revise the document. | The text in Section 8.2.3 (page 51) has been changed from "LOAEL" to "NOAEL." |
| **Table Comments** | | |
| 1 | Table 8: Surface Water Chemistry: The risk summary is missing aluminum, barium, cadmium, cyanide and iron. Note that cyanide is mentioned in Section 4.2.8 as a primary COPC for surface water in UHC. Chromium and cobalt are not identified as either primary or secondary COPCs, despite being listed under multiple lines of evidence with moderate weight. Revise as necessary. | Aluminum, barium, cadmium, cyanide, and iron were added to Table 8's and Table 9's Surface Water Chemistry Risk Summary. Chromium was added to Table 8's Secondary COPCs list. While cobalt concentrations in sediment, surface water, and benthic tissues are higher at UHC than at the background location, they do not exceed sediment or tissue benchmarks or surface water quality standards (*i.e.*, cobalt is not listed under sediment chemistry, benthic tissue, or surface water chemistry lines of evidence). Therefore, cobalt was not added as a secondary COPC to Table 8 or 9. |
| 2 | Table 14: There are several COPCs (e.g. selenium, chromium, barium, etc) which are identified for both mammals and birds, yet are not identified as primary COPCs. Please clarify. | Footnote "(e)" in Table 14 has been updated to match the text in Section 8.2.4: "Secondary COPCs are those chemicals that yielded HQs > 1 (based on LOAEL) for at least one receptor, but not consistently across receptors, or they include key sources of uncertainty, affecting either exposure or effect estimates, as discussed in Section 8.2.3." |

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| **Appendix B Comments** | | |
| 1 | Table B.8: The 95% UCL is 8.971 mg/kg for arsenic, which is based on the 95% H-UCL. The ProUCL output and the User's Guide indicate H-statistic based UCLs are computed for historical reasons only and it is recommended to avoid its use. Instead, use the next highest suggested UCL, which is 8.691 mg/kg for the 95% Modified-t UCL. | The following 95% UCL values were changed from the 95% H-UCL to the next-highest UCL with the same data distribution identified by ProUCL (*i.e.*, the next-highest UCL for the lognormal distribution in each of the following cases):<br><br>• **Table B.1:** Aluminum changed from 3.64E+03 (95% H-UCL) to 3.88E+03 (90% Chebyshev [MVUE] UCL), which is the next-highest UCL, assuming lognormal distribution.<br>• **Table B.1:** Manganese changed from 2.63E+02 (95% H-UCL) to 2.81E+02 (90% Chebyshev [MVUE] UCL), which is the next-highest UCL, assuming lognormal distribution.<br>• **Table B.3:** Arsenic changed from 4.01E-02 (95% H-UCL) to 4.59E-02 (95% Chebyshev [MVUE] UCL), which is the next-highest UCL, assuming lognormal distribution.<br>• **Table B.3:** Zinc changed from 2.49E-02 (95% H-UCL) to 2.90E-02 (95% Chebyshev [MVUE] UCL), which is the next-highest UCL, assuming lognormal distribution.<br>• **Table B.8:** Arsenic changed from 8.97 (95% H-UCL) to 9.69 (95% Chebyshev [MVUE] UCL), which is the next-highest UCL, assuming lognormal distribution.<br><br>These changes to the 95% UCLs (and the EPCs) did not result in any new screening level exceedances in Appendix C or D. |
| 2 | Tables B.13: The output was not provided for the values in this table and instead, it appears a duplicate of the output for Table B.14 was provided. This should be reviewed and the correct output provided. | The correct output is now provided. |
| 3 | Table B.15: Instances where the UHC EPC is greater than the non-detect background USL (based on the detection limit) should be identified with a footnote in the text. | The note "> Max. DL" was added to indicate when UHC EPCs are greater than background maximum detection limits. |

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| **Appendix C Comments** | | |
| 1 | Table C.7: Dibenzofuran and isopropylbenzene (cumene) are not present in the source document, NJDEP 2008 *Chemical Properties for Calculation of Impact to Ground Water Soil Remediation Standards*. Please add the correct citation to this table (RSL, November 2017). | The $K_{oc}$ values were reviewed against the NJDEP (2008) and ORNL sources. NJDEP was used as the primary source, whereas ORNL was used as a secondary source if no $K_{oc}$ values were reported in NJDEP. Based on this review, the $K_{oc}$ values for delta-BHC, 4-chloroaniline, dibenzofuran, and isopropylbenzene were updated in Tables C.1 and C.7. The updated $K_{oc}$ values and associated sediment quality guideline values resulted in additional exceedances for 4-chloroaniline and dibenzofuran. Given that no sediment toxicity was observed, these additional exceedances do not impact the conclusions of the benthic invertebrate risk assessment.<br>The footnotes in Table C.1 and C.7 were also updated to reflect that the $K_{oc}$ sources were NJDEP (2008) and ORNL |
| 2 | Table C.12: The CBR value of 160 mg/kg for di-n-butylphthalate in Table C.12 does not have supporting records in Table C.15; these records should be added to Table C.15. | The supporting record for the CBR value of 160 mg/kg for di-n-butylphthalate in Table C.12 has been added to Table C.15. |
| 3 | Tables C.15 and C.16: There are some discrepancies in the values presented in these tables compared to the ERED data set: e.g., in Table C.15, the lowest ED under 25 (or LOED) for endrin is 1.4 mg/kg, which is the ED13 for eastern oyster compared to a LOED of 0.05 mg/kg for an assortment of crayfish, lobsters, crabs and shrimp. The applied hierarchy in the tables does not appear consistent with the hierarchy described in Section 4.1.5 of this BERA. | The ERED datasets in Tables C.15 and C.16 were checked against the hierarchy for data selection, presented in Sections 4.1.5 and 5.1.2. In addition, Tables C.15 and C.16 were updated because of changes to the reported data in the most-recent version of the ERED database. Finally, note that absorption was added to the text in Section 4.1.5 as an acceptable exposure route for data selection. Based on this, several CBR values in Tables C.12 and C.14 changed. To facilitate EPA's review, we have included a comparison of the previous CBR values to the revised CBR values (shown to the right of the Tables C.12 and C.14 in the Excel file). Updates to Tables C.12 and C.14 are summarized below.<br><br>**Appendix C, Table C.12 – Benthic Invertebrates:**<br><br>• CBR values decreased for 14 analytes and increased for 23 analytes. The heptachlor epoxide's CBR was removed, since it was based on an injection exposure route, which does not align with the data selection hierarchy;<br>• Chromium was dropped from the COPC list, due to an increased CBR value; and<br>• Vanadium was added to the COPC list due to a new CBR value. |

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| 3 *cont.* | | **Appendix C, Table C.14 – Forage Fish:**<br><br>• CBR values decreased for 5 analytes and increased for 14 analytes, and new CBR values were added for 8 analytes;<br>• No COPCs were dropped due to increased CBR values; and<br>• Barium, zinc, and atrazine were added to the COPC list, due to decreased CBR values.<br><br>Text Table 8's Benthic Tissue Chemistry and Table 9's Fish Tissue Chemistry Risk Summaries were updated consistent with the changes to Appendix C, Tables C.14 and C.15. In addition, text Sections 4.2.6 and 5.2.3 were updated. These changes did not impact the WOE conclusions or the primary COPCs identified for benthic invertebrates and fish (barium was added as a secondary COPC for fish in Table 9). |
| **Appendix D Comments** | | |
| 1 | Table D.2: Exposure parameters are presented for the "Lesser Scaup" however this organism is not evaluated for this Site and thus this information should be removed from this table. | The exposure parameters for the Lesser Scaup have been removed from Table D.2. |