USEPA comments on the Draft Baseline Ecological Risk Assessment Work Plan
Columbia Falls Aluminum Company NPL Site
Columbia Falls, Montana

Responses Prepared for Columbia Falls Aluminum Company, LLC by Roux / EHS Support, LLC
Dated February 13, 2018

Specific Comments – USEPA Comments in Black. **Roux / EHS Support LLC responses in blue. USEPA Response to Roux / EHS Support LLC responses are in green. Responses are only included when further discussion or follow-up may be needed. Roux / EHS Support LLC responses in orange.** Outstanding EPA responses are in red. Roux/EHS second response in purple.

1) Section 3.1 (Page 10) – It is inappropriate to include comparisons of dioxin and furan levels to U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) in a BERA workplan. Remove these comparisons and discussion.

   The reference to USEPA RSLs for dioxins/furans was in a general bulleted summary of the Phase I Site Characterization Data Summary Report findings. The bullet will be removed to avoid confusion in the BERA WP.

   As indicated during the January 17, 2018 conference call with USEPA and Montana Department of Environmental Quality (MDEQ), ecological exposure to dioxins/furans measured in soil samples collected in the Main Plant Area will be evaluated as part of the COPEC refinement in the Revised BERA WP based on the toxicity equivalency quotient (TEQ) approach (USEPA, 2008). Any additional dioxin/furan data collected during the Phase 2 Investigation will be evaluated based on the TEQ approach in the BERA Report. The risk characterization of dioxin/furan TEQs will consider the current and future availability of ecological habitat in the Main Plant Area where soil samples were collected.

   Section 3.4.3.1 (page 30) – presents rationale for not evaluating dioxins/furans for terrestrial plants and invertebrates. However, LANL's EcoRisk (Release 4.1) provides a screening value for invertebrates. This value should be included and the evaluation should include invertebrates. The text should be revised as appropriate. The text also mentions that Efroymson et al. 1997 will be the toxicity value source. LANL's EcoRisk should be considered as a source of TRVs for mammals. Please include the TRV values used in Table A-4.

   The revised text in the BERA Work Plan indicates that terrestrial plants and invertebrate exposure to dioxin/furans will not be considered in the screening evaluation since it has been demonstrated that a wide variety of invertebrates and plants are insensitive to dioxin/furan exposure <u>relative to birds and mammals</u> (USEPA, 2008). The soil invertebrate no observed effect concentration (NOEC) provided in the LANL EcoRisk database for earthworms exposed to 2,3,7,8-TCDD substantiates this statement. The LANL EcoRisk ecological screening level (ESL) for soil invertebrates is 5 mg/kg, which is 7 orders of magnitude greater than the NOEC ESL for mammals (0.00000029 mg/kg $TEC_{2,3,7,8\text{-}TCDD}$; LANL EcoRisk) and 6 orders of magnitude greater than the NOEC ESL for birds (0.00000158 mg/kg $TEC_{2,3,7,8\text{-}TCDD}$; Efroymson et al., 1997), indicating that invertebrates are insensitive to 2,3,7,8-TCDD relative to the sensitivity of birds and

mammals. Given the differences in the ESLs between soil invertebrates and birds/mammals, the LANL EcoRisk NOEC ESL for soil invertebrates will not influence the outcome of the screening process. However, for completeness, the LANL soil invertebrate ESL will be included in the evaluation of soil-dwelling invertebrate exposure to dioxin/furans in the BERA.

The table below summarizes the 2,3,7,8-TCDD toxicity equivalence concentrations ($TEC_{2,3,7,8\text{-}TCDD}$) and sources presented for birds and mammals in Table A-4 of the BERA Work Plan:

Receptor Group	BERA Work Plan Table A-4		Revised Ecological Screening Value	
	$TEC_{2,3,7,8\text{-}TCDD}$ ESV (mg/kg)	Source	$TEC_{2,3,7,8\text{-}TCDD}$ ESV (mg/kg)	Source
Mammals	3.15E-07	Efroymson et al. (1997); Sample et al. (1996)	0.29E-07	LANL EcoRisk
Birds	1.58E-06	Efroymson et al. (1997); Sample et al. (1996)	1.58E-06	Efroymson et al. (1997); Sample et al. (1996)

As shown, there is minimal difference in the mammalian $TEC_{2,3,7,8\text{-}TCDD}$ values; however, as requested, the LANL EcoRisk mammalian $TEC_{2,3,7,8\text{-}TCDD}$ of 0.29E-07 mg/kg will be used as an ESV in the BERA. The LANL EcoRisk database does not provide $TEC_{2,3,7,8\text{-}TCDD}$ value for birds; therefore, the value presented in the BERA Work Plan will be used as an ESV in the BERA.

2) Section 3.3.5 (Page 16) – The table summarizing semi-aquatic surrogate receptors does not include an avian insectivore. Please add a surrogate an avian receptor representing this feeding guild.

The table of semi-aquatic receptors will be updated to include American dipper (*Cinclus mexicanus*) as a surrogate to represent the avian insectivore feeding guild.

EPA Response: Additional information pertaining to general habitat/exposure area was added to the T/E species summary table on page 17. An independent review of the information reveals that the information included was overly specific in some cases and lacking in detail in others when compared to the Montana Field Guide (http://fieldguide.mt.gov/). Recommend including an expanded discussion of T/E species in the BERA and removing this information from the workplan.

As requested, information pertaining to general habitat/exposure area for special status species will be removed from the BERA Work Plan. This information will be revisited and expanded in the Problem Formulation of the BERA to evaluate the potential for special status species to be present in exposure areas of the site based on species-specific habitat requirements. The Montana Field Guide, in addition to other literature sources, will be used to describe the habitat requirements of special status species.

3) Section 3.4 (Page 22) – As discussed in USEPA (2001), re-screening chemicals based on refined ESVs for the purposes of refining the list of COPECs may be appropriate for the BERA, but does not belong in this stage of the risk assessment process (i.e., the BERA workplan). Please revise the workplan accordingly.

The refinement of COPECs is consistent with Section 3.2 of ERAGS as part of the BERA Problem Formulation. Supplemental federal guidance on ecological risk assessment identifies COPEC refinement as an important step to focus the ecological risk assessment process (USEPA, 2015; TSERAWG, 2008; USEPA, 2000; U.S. Navy, 1999). In practice, COPEC refinement is often conducted as a refinement step in the SLERA intended to focus the BERA Problem Formulation. COPEC refinement was not included as part of the SLERA submitted for the Site; therefore, a refinement step was included in the BERA WP Problem Formulation to identify and focus further ecological risk analyses on COPECs that have the potential to drive ecological risk in the BERA.

EPA Response: Refinement of COPECs would be appropriate if it has been demonstrated that the Site has been adequately characterized. Because additional data are being collected to characterize spatial and temporal variability, this refinement is not appropriate at this time.

Re-screening constituents based on refined ESVs is a critical component of the COPEC refinement step given the conservative assumptions that were included in the SLERA screening process. For detected constituents with available ESVs, the SLERA identified COPECs based on maximum detected concentrations exceeding minimum ESVs. While this screening approach has a low probability of erroneously removing constituents that may pose an actual ecological risk, it is not indicative of COPECs that are likely to result in adverse ecological effects. Re-screening constituents based on refined ESVs that are protective of chronic exposure, but represent a broader range of no observed effect concentration (NOEC) endpoints, focuses further risk analysis on those COPECs that have greater potential to result in adverse ecological effects. The uncertainty in erroneously removing constituents from the BERA based on refined ESVs is limited to constituents with maximum concentrations that occur within the concentration range between the minimum ESV and refined ESV values. Given that minimum ESVs used in the SLERA and refined ESVs presented in the BERA WP are representative of chronic NOEC endpoints, there is a low probability that a constituent with a maximum concentration within this range will pose an actual ecological risk.

EPA Response: Screening of data to be collected in the next phase should be performed using the original screening values because spatial and temporal variability hasn't been characterized. When refined ESVs are developed in the future, agreement on the range of no observed effect concentration (NOEC) endpoints is needed as these have not been specified. The last statement in the paragraph above assumed that the Site has been adequately characterized and therefore is inappropriate to assume.

As indicated in Section 3.4 of the revised BERA WP, maximum concentrations of constituents in Phase I and Phase II Site Characterization datasets will be initially compared to minimum ESVs (original screening values) presented in the SLERA.

Also, as indicated in Section 3.4, an interim deliverable will be prepared for USEPA and MDEQ review to support the selection of revised ESVs from a range of NOECs identified in literature sources.

The last statement of the prior response is not included in the BERA WP. It is understood that the final COPEC screenings can only be completed when the Site has been adequately characterized.

4) Section 3.4 (Page 22) –Essential nutrients may be excluded in the BERA if it can be demonstrated that Site concentrations are less than ecological screening values (ESVs) and/or equal to or less than background. Because an adequate background dataset is not currently available, it is not appropriate to include this evaluation in the BERA workplan.

Like the analysis of regional background concentrations for other metals, conservative estimates of regional concentrations were used to provide regional context to site concentrations of essential nutrients in site soils and sediments. Regional data compiled by the USGS for western conterminous U.S. soils were evaluated to assess the need for further evaluation of essential nutrients. The results of these analyses indicated that the ranges of essential nutrient concentrations in site surficial soils and sediments were within the geometric mean +/- geometric standard deviation of western conterminous U.S. soils for essential nutrients other than calcium.

The refinement of essential nutrient COPECs based on regional USGS data will not be used to eliminate individual constituents from further analysis in the Phase 2 investigation. Essential nutrients included in the analytical suite proposed in the Phase 2 SAP will be analyzed and re-screened based on the combined Phase 1 and Phase 2 data for each exposure medium sampled within each exposure area (see response to Comment #7). Further evaluation of essential nutrient concentrations relative to representative background concentrations will be conducted in the BERA based on data collected as part of a background study that will be proposed in the Phase 2 SAP.

EPA Response: Section 3.4.3 (Page 28) - The refined ESVs presented in the BERA require removal or disclaimers stating that they are subject to change pending EPA review. Because there are several places within the BERA WP that state these values may be used in COPEC refinement and concurrence has not been reached on the values to be used, these values require removal or additional information to clearly state the values are preliminary and subject to change pending EPA/DEQ review. In particular, values based on mean Montana background values are of concern.

As stated in Section 3.4, the preliminary COPEC refinement is not intended to remove COPECs from further consideration in the Phase II Site Characterization or BERA. Rather, the COPEC refinement is intended to identify and provide context for those constituents that are likely to be focal COPECs in the BERA process. As stated in the response to Comment #3 above, the refinement of ESVs will be described in an interim deliverable that will be submitted to USEPA for review and approval. USEPA's concern regarding use of mean Montana background values is noted. Site-specific background data collected as part of the Phase II Site Characterization will supplant mean Montana regional soil data in the COPEC refinement process conducted as part of the BERA Problem Formulation.

5) Section 5.2.3.2 (Page 46) – Please include a summary of the uptake models that will be selected to estimate dietary item tissue concentrations.

Uptake models that will be selected to estimate dietary tissue concentrations will be summarized in an interim deliverable to USEPA prior to the initiation of dietary exposure modeling for the BERA. The BERA WP will be revised to note that this information will be submitted as an interim deliverable.

EPA Response: The table on page 52 without a title/number indicates that for large home range receptors, select surface water features will be included in the EPC calculation for individual exposure areas. For large home range receptors with a home range larger than the site, all surface water bodies should be included in the EPC calculation and the Site as a whole should be the basis of the soil EPC.

The table on page 52 of the BERA Work Plan will be revised to include all surface water sources in the calculation of EPCs for wildlife ingestion modeling for large home range species.

As indicated in the BERA Work Plan, an interim deliverable has been developed and submitted to EPA and MDEQ for review to provide additional detail regarding the approach for conducting wildlife ingestion modeling in the BERA. As stated in the interim deliverable, the estimated daily dose (EDD) for receptors with large foraging ranges will be calculated as the sum of the area use-weighted doses obtained from exposure areas within the typical home range of the receptor. In the case of receptors with foraging ranges larger than the site, the estimate of the EDD obtained from the Site will be based on the weighted sum of doses calculated for all relevant exposure areas within the Site.