CDM Smith

Memorandum

To: *Mike Cirian, USEPA*

From: *Sean Coan, P.G.; Curt Coover, P.G.; Erin Formanek; Teddy Marcum; Damon Repine, CSP*

Date: *November 12, 2015*

Subject: *Draft Comments – Revised Remedial Investigation/Feasibility Study Work Plan; Revised Phase 1 Site Characterization Sampling and Analysis Plan, Former Primary Aluminum Reduction Facility, Columbia Falls, Montana*

CDM Federal Programs Corporation (CDM Smith) at the request of the United States Environmental Protection Agency (USEPA), has reviewed the revised *Remedial Investigation/Feasibility Study (RI/FS) Work Plan* (RI/FS Work Plan) and the revised *Phase I Site Characterization Sampling and Analysis Plan* (SAP), and correspondence *Re: Response to Comments on Draft RI/FS Work Plan, Columbia Falls Aluminum Company*, dated November 2, 2015, prepared by Roux Associates, Inc. (Roux) on behalf of the Columbia Falls Aluminum Company LLC (CFAC) for the Former Primary Aluminum Reduction Facility (Site), located in Columbia Falls, Montana. Comments are organized in General and Specific Comments. Specific Comments are organized by corresponding section(s) of the document(s). Note that Specific Comments reference page numbers and sections of the redlined document files provided by Roux.

General Comments

1) Sediment Porewater – There is still mention of the collection of sediment porewater in the Phase I Site Characterization SAP. Please remove sediment porewater from the document as this medium will be sampled as part of the Phase II Site Characterization.

2) Additional information has been provided in the revised RI/FS Work Plan to describe the Conceptual Site Model and how the risk assessments will be performed. In general, these revisions adequately respond to comments made on the Draft RI/FS Work Plan. A few additional questions on the revisions and editorial issues remain and are incorporated into the specific comments that follow. Similarly, additional information has been provided in the revised SAP and in general adequately addresses comments made on the Draft SAP. However, some of the statistical evaluations and comparisons discussed in the SAP may not be appropriate or adequate. These issues are also incorporated into the specific comments that follow.

Specific Comments

1) RI/FS Work Plan Section 2.6, page 11 – Please replace the sentence "*However, because the species of concern are listed by county, it cannot be definitely determined which species can be found within the Site boundary,*" with an explanation that a site-specific survey will be performed to determine the presence or potential presence of species of concern.

2) RI/FS Work Plan Section 2.6, page 13 – The reference for FWP should be provided.

3) RI/FS Work Plan Section 2.8.9, page 23 – Please state that values were below residential RSLs. It is not correct to state that samples were in compliance with residential risk-based criteria since these screening values are not regulatory compliance values.

4) RI/FS Work Plan Section 2.8.14, page 24 – Please clarify the last two bullets. Are targets potential receptors? The meaning of this phrase is not clear: "*...and pathways by which they may be or are being transmitted*". Also, unless biota samples are collected it would not be possible to determine if receptors "*have actual contamination*".

5) RI/FS Work Plan Section 2.8.14, page 26, 3rd bullet – Please define 'low concentrations'. Last bullet – Clarify if "the potential impact to soil and air exposure pathways appear to be low" refers to all chemicals detected or VOCs only.

6) RI/FS Work Plan Section 2.8.14, page 26, last bullet – Please clarify if "the potential impact to soil and air exposure pathways appear to be low" refers to all chemicals detected or VOCs only.

7) RI/FS Work Plan Section 2.8.14, page 26, USEPA Site Reassessment, 2014, 1st bullet for residential well sampling – Please provide the range of detection limits for cyanide since all results were non-detect.

8) RI/FS Work Plan Section 3.1.3, page 34 – Please describe the classes of analytes that were not detected or present at concentrations above drinking water standards.

9) RI/FS Work Plan Section 3.1.3, page 35 – Please clarify the statement "applicable groundwater and drinking standards".

10) RI/FS Work Plan Section 3.1.5, page 36 – Please expand the discussion. Although pesticides may not be related to historical manufacturing and production operations they are related to Site maintenance operations and thus would be classified as Site-related. The discussion of pesticide data quality is not sufficient to conclude that results are a result of lab or other interferences.

11) RI/FS Work Plan Section 3.2.6.3, page 50 – Please ensure that Section 2.8.15 is still a valid reference. It is suggested adding that seep water is tested for acute aquatic toxicity. It appears that chronic toxicity tests are not performed.

12) RI/FS Work Plan Section 3.6.1, pages 61-62 – Please reference the June 2015 OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air and the June 2015 USEPA Vapor Intrusion Screening Level calculator as preliminary items To Be Considered (TBC) for evaluating soil vapor results. Please explain how soil vapor results will be screened using these TBCs.

13) RI/FS Work Plan Section 5.3.2, page 73 and SAP Section 4.6.1, pages 20 and 21 – Please add detail to the proposed method of double-cased well drilling to avoid cross-contamination into deeper water-bearing zones. Also, it is unclear how shallow contamination will be identified. Please clarify how shallow contamination will be identified to ensure the most protective drilling techniques are employed when drilling through confining layers.

14) RI/FS Work Plan Section 5.3.3, page 81 – Will the additional soil borings at dry well locations be completed in Phase II? If not, please provide additional detail on timing of the data evaluation in order to select soil boring locations.

15) RI/FS Work Plan Section 5.5, page 84 – Typically a goal of collecting background samples is not to identify additional source areas. Provide a contingency plan (e.g., collect more background samples) if additional source areas are identified in the "background" locations.

16) RI/FS Work Plan Section 5.7, pages 88-89 and SAP Section 4.11, page 30 – Please indicate that the fate and transport evaluation will start during Phase I and be continued subsequent to collecting hydrogeologic data during Phase II. Hydrogeologic data collected must be incorporated into the fate and transport evaluation.

17) SAP List of Acronyms – Please revise the List of Acronyms to define ~~CPOC~~ COPC as "~~Chemicals~~ Contaminants of Potential Concern" (emphasis added). Please also add Target Compound List (TCL) to the List of Acronyms.

18) SAP Section 4.6.1, page 19: Please describe how the specific depths soil samples will be collected that will aid in determining the nature and extent of contamination. Also, please provide an alternative to allow for additional opportunistic soil samples that may be collected at the discretion of the field team if contamination is evident or likely at different depths including deeper than twelve feet, conditions indicate the possibility of preferential pathways, or conditions prevent sampling at the listed depths.

19) SAP Section 4.6.1, page 21 - Borings must be abandoned using grout or bentonite chips in accordance with Roux SOP 10.3. The top three feet of each boring may be backfilled with soil

20) SAP Section 4.6.2, page 21 – The ISM design outlined in the SAP will not be adequate to estimate the mean soil concentration for a decision unit given that only one replicate per decision unit will be collected. As stated in ITRC (2012), "a single ISM result is likely to underestimate the mean more than 50% of the time for most distributions; the likelihood of a decision error increases as the variance in the distribution increases and the difference between the action

level and true mean decreases". As such, the data that will be collected will not be adequate for ecological risk evaluation.

Regarding decision units, there is no basis for the selection of one-acre. It is highly likely that there are ecological receptors with home range sizes that are smaller than this (e.g. a quarter acre for a shrew, a common small home range surrogate receptor). Therefore, one incremental sample (one replicate) from an area four times that of the home range of the smallest receptor is not sufficient for ecological risk evaluation. Subsequent data will need to be collected as part of focused future investigations in areas of adequate ecological habitat and where concentrations in initial samples are near threshold values.

Regarding the average concentration providing value to the evaluation of the CTE receptor in the BHHRA, the 95 UCL of the mean is required by EPA for risk calculations. Computing a 95 UCL of the mean is possible because is it likely that the decision unit for a human receptor is greater than one acre. It is important to note that the difference between CTE and RME risk estimates lies in the exposure parameters assumed for each, not the basis of the exposure point concentration.

21) SAP Section 4.6.3, page 22 – Typically a goal of collecting background samples is not to identify additional source areas. A contingency plan for collecting additional background samples should be discussed in the event that the selected locations identify other source areas as mentioned in the list of goals for the background area soil investigation.

22) SAP Section 5.1, page 23 - Add SOP for the handling of IDW (in the event disposable equipment is used).

23) SAP Section 6.5.2, page 44, Question 3 – Based on the number of samples specified for some media (e.g., surface water, sediment) statistical comparisons with reference concentrations will not be possible. It will likely be necessary to perform other types of comparisons which are not as robust as statistical comparisons.

24) SAP Section 6.5.2, page 44, Question 5 – Please include in this question the possible movement of COPCs offsite.

25) SAP Section 6.5.3, page 46, 1st bullet – This statement does not seem to adequately address potential offsite contamination as the characterization appears to end at the Site boundary.

26) SAP Section 6.5.3 page 46, Section 6.5.5, page 54 – The information inputs and analytical approach for the decision statement (Determine if COPC concentrations in Site surface soil, subsurface soil, surface water, sediment porewater, sediment, and groundwater are statistically greater than reference concentrations and are identified as Site-related COPCs.) are not valid. It is not appropriate to compare the maximum concentration for Site media to a 95 UCL of the mean for reference media.

One of the biggest limitations of the judgmental sampling design is statistical inferences are limited. However, for soil, Site data from a decision unit could be statistically compared to reference data in the determination of site-related impacts if the Site data were adequate. Currently, the sampling design does not allow this because only one replicate is being collected for soil, in some cases one duplicate is called for. If the data are indeed intended to be compared statistically to reference location data, a minimum of three replicates (or samples) per decision unit is required for Site locations. If those data are collected, they could be compared to reference data according to the following guidance: *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (USEPA 2002). USEPA's ProUCL software is a useful tool for computing the significance of these data.

For other media types, decision units have not be clearly articulated at this time and the Site samples being collected are possibly biased due to the judgmental sampling design making statistical comparison to reference samples difficult. In addition, the number of reference samples slated to be collected may be inadequate for certain media types (a minimum of 3 is required). Section 6.5.3 should be revised so that adequate reference data are collected if indeed a comparison of Site versus reference is to be made with the data that are to be collected in Phase I.

27) SAP Section 6.5.3, pages 46-47, 2nd bullet – The statistical comparisons suggested in this bullet will need to be reevaluated. If site-specific background data are available use of regional background data (State of Montana) is unnecessary. It is not clear what is meant by background concentrations from this effort will also be evaluated in the context of prior background soil sampling. If data are comparable it may be beneficial to combine datasets. Also it may not be appropriate to compare results from discrete samples with incremental sample results. When enough (e.g., at least 10) site observations are available, it is preferable to use hypotheses testing approaches for background evaluations. Different parameters should not be compared (e.g., averages with maximums). Averages should be compared with averages or UCLs, and individual site observations should be compared with upper prediction limits (UPLs), upper percentiles, upper tolerance limits (UTLs), or upper simultaneous limits (USLs).

28) SAP 6.5.3, page 47 – Please describe what aquifers will be screened in the upgradient reference well. Discuss if reference surface water and sediment reference locations will be sampled as frequently as site locations.

29) SAP Section 6.5.6.5, pg. 61 – The last statement "the results from Phase 1 sampling around source areas will likely be biased high relative to average conditions within the source area" should be removed or revised as it is not entirely true. For soil in particular, as stated in a previous comment, "a single ISM result is likely to underestimate the mean more than 50% of the time for most distributions; the likelihood of a decision error increases as the variance in the distribution increases and the difference between the action level and true mean decreases" (ITRC 2012).

30) SAP Section 6.5.6.2 (should be 6.5.6.7), page 62 – It is stated that "Quantitative analysis of decision error limits and uncertainty is not feasible when implementing a judgmental sampling program". It is recognized that meaningful quantitative analysis is difficult accomplish due to the nature of the data that are collected. However, if an adequate number of replicates was collected for soil, the following is an example of decision error limits that would be applicable.

For the decision question where reference condition concentrations are identified and evaluated against Site data, the comparison of Site concentrations to reference concentrations assumes that concentrations are "Site-related" until proven otherwise. Thus, the null and alternative hypotheses are as follows:

H_0: The analyte concentration in Site surface soil, subsurface soil, surface water, sediment, and groundwater are higher than reference; the analyte is a Site-related contaminant for that medium.

H_A: The analyte concentration in Site surface soil, subsurface soil, surface water, sediment, and groundwater are less than or equal to reference; the analyte is not a Site-related contaminant for that medium.

Because a Type I error is the more severe decision error (i.e., an analyte would be dismissed as being Site-related when it could be present as a consequence of Site activities), the tolerable limit for α is set lower than for β. The decision error limits selected for this investigation are based on the minimum values recommended in EPA (2002a) for a Form 2 background test. Therefore, when making comparisons to reference, the probability of a Type I error should not exceed 10% ($\alpha = 0.10$) and the probability of a Type II error should not exceed 20% ($\beta = 0.2$).

31) SAP Section 6.5.6.2 (should be 6.5.6.7), page 62 – The following statement: "This approach is overall a very conservative approach and minimizes the potential for a Type 1 decision error (i.e., an analyte would be dismissed as a COPC when it could be of potential risk)" cannot be considered valid without first assuming that the variance in the distribution of COPC concentrations is low. If there is high variability and only one replicate is collected for soil, it is likely that concentrations will be underestimated resulting in an increased potential for a Type I error. For this reason, the soil sampling design should be reconsidered. Along those same lines, the variability of contaminant concentrations in other media should be considered. If there is high variability, is it appropriate to perform a COPC selection after data are collected in Phase I? Perhaps it is more appropriate to select groups of chemicals to be carried forward in future investigations at this time rather than a finite list.

32) SAP Table 1, Response to Specific Comment 91: Please clarify the method to be used for analysis of hardness. Revised Table 1 includes analysis of hardness by SM2340B, but the response to Specific Comment 91 indicates that method 200.7 will be used to analyze for hardness.