Integrated Alaska Department of Environmental Conservation and U.S. EPA Region 10 Risk Assessor
Comments on Proposed Approach to Evaluating Consumption of Wild Foods at the Red Devil Mine Site, AK, V2

Commenter: (ADEC) **Comments Developed: August 16, 2012**

Cmt. No.	Pg. & Line		Comment/Recommendation	Response
1.	1		Title should more broadly reflect that this document is evaluating exposure assumptions for the RDM HHRA	The approach presented in this technical memorandum is incorporated into the human health risk assessment (HHRA), Section 6.2 of the RI; therefore the memo will not need to be finalized. The draft memo and final response to comments will be included as an appendix to the HHRA.
2.	2		What about dermal exposure? Presumably skin surface area would vary as a function of climate.	Dermal exposure is addressed in the HHRA.
3.	2		Available Harvest and Consumption Data, Prior to 2012: The data analysis techniques of Wolfe and Utermohle should be applicable to any data set if relevant information is collected. It is unclear why data from 1983 or earlier would not be applicable if all relevant information was contained in the data set.	Since the ADF&G 2012 report is now available, data from previous surveys were not used in the risk assessment.
4.	3		The memo notes that Ballew et al. 2004, provided median and maximum consumption rates and implied that gram per day values would be provided for both median and maximum consumption rates, however, Table 1 only includes median consumption rates. Maximum consumption rates from Ballew et al. 2004 should be included as well.	Since the ADF&G 2012 report is now available, less emphasis is placed on the previous studies. See text in Section 6.2.3.5 of the RI.
5.	4		Clarify that the IDM values in Table 1 of the tech memo came from best fit distributions to regional harvest data as tabulated in Table 13 of the IDM 1997 report.	Since the ADF&G 2012 report is now available, less emphasis is placed on the previous studies. See text in Section 6.2.3.5 of the RI.
6.	4		Table 2. If the Wolfe and Walker fish consumption rate is a median value, then it should clearly be represented as such in Table 2 and not represented as a mean with a footnote identifying it as a median value. Fish consumption distributions are right skewed and means are always greater than medians.	Since the ADF&G 2012 report is now available, less emphasis is placed on the previous studies. See text in Section 6.2.3.5 of the RI.

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7.	6		The paragraph should reflect the 95th percentile values that are now available for use.	95th percentile values were used in the HHRA, except for large land mammal. Once these values are received from EPA, they will be incorporated.
8.	6		Harvest rates of all eight villages surveyed should be compared. Presumably ADFG computed 95th percentile harvest statistics for all eight villages, why aren't these values used in the comparisons?	See response to EPA comment #8.
9.	9		Discuss information indicating that no other types of berries were available on the site.	Berry data collection was attempted in 2011, but there were not sufficient samples for use in the HHRA. Additional sampling will be attempted again in 2012. Information on current berry sampling attempts is discussed in Section 6.2.3.7 of the RI.
10.	10		What other FIs will be presented in the RA as part of the sensitivity analysis & what is their basis?	Information is provided in Section 6.2.3.5 of the RI.
11.	11		Should include some discussion of what to do if a valid UCL cannot be calculated for an EPC.	Valid EPCs were calculated for all media in the RA.
12.	12		EPA has commented that use of a food chain multiplier is all that can be done given the current state of data analysis. While EPA has agreed to this approach for the draft risk assessment, EPA believes that it may be appropriate to collect further data to better characterize human health risks from fish consumption. EPA and ADEC have also noted that the data analysis of mercury levels in fish in the Kuskokwim is not sufficient to describe RDM impacts on fish tissue Hg concentrations in the Kuskokwim.	Mercury levels are further discussed in *Mercury in Aquatic Biota from the Middle Kuskokwim River Region, Alaska, 2010-2011*(Draft). Information from this report will be incorporated into the risk assessment, as appropriate.
13.	12	& Table 6	The data from (from 3 composite fish) Sculpin for Methylmercury is limited for the Risk Assessment. Gray et al. 2000 data from fish samples showed that 90% of total mercury detected comprised of methlymuercury in fish sample from the Red Devil mining site. Other studies in fish have concurred that the majority of total mercury detected in fish is methylmercury in some cases 100%. However, when referring to Table 6	For the HHRA, 100% of the total mercury concentration was assumed to be in the methylated form. The methyl mercury result was not used in the HHRA due to low sample number.

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			of the single Sculpin sample from August 2010, the methylmercury to total mercury is 0.16 to 3.7 or only 4%. Based upon the available literature, our data may grossly underestimate the methylmercury concentration in the fish. There is a great deal of uncertainty associated with the limited data we are using and we should acknowledge this uncertainty by collection of additional data to validate our assumptions or otherwise assume 100% methylmercury as a conservative estimate in addition to the site specific data proposed for use.	
14.	15		Please specify why only green alder bark sample results are going to be used for moose COPC calcs, green alder bark for beaver, and spruce needles for spruce grouse? Are these plants the primary diet of the assessment species or are we limiting ourselves to the vegetation data available at hand?	Additional information will be provided in Section 6.2.3.7 of the HHRA regarding use of vegetation to estimate concentrations in moose, beaver, and spruce grouse. Use the data is based on a combination of primary food sources and available data.
15.	16		There is a great deal of uncertainty associated with extrapolating contaminated soil data from two studies into blueberry concentrations. An attempt should be made to collect more blueberry data. Is the soil in table 9 representative of the area where the plant parts were collected in the study? If so, then why aren't they being used? How exactly is the comparison going to be made? Please provide details and what will be done if values are considered inappropriate? Are there transfer coefficients provided for steam and leave in the Baes et al (1984) for evaluation of the data in table 9. The specific numbers that are going to be used should be provided in a table format.	Berry data collection was attempted in 2011; there were not sufficient samples for use in the HHRA. Additional sampling will be attempted again in 2012. Without berry data, modeled data was used. Transfer coefficients will be added to Draft Final HHRA. As directed by DEC and EPA, blueberry data from Bailey et al. 2002 or Bailey and Gray 1997 are not used quantitatively the risk assessment.
16.		Table 7 & 8	The notes are confusing "1- included 8 samples plus one field duplicate"? Field duplicates should not be included in calculating the EPC twice. Please specify that the most conservative of the primary and duplicate sample results will be used for statistical analysis. What EPC is going to be used for the ND in methylmercury?	These tables have been updated and the data presented in Table 6-41 of the risk assessment.

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			A foot note for J should be included.	
17.		Table 10	Table should not present average metals concentrations as averages will not be used as exposure point concentrations.	This table was included in the HHRA as Table 6-7. Ranges, including maximums, are provided in Table 6-7. Discussion of the maximum concentrations and, possibly, the 95% UCL will be added to this section.
18.	General	Tables	The 95th percentile UCL should be calculated for the tables that contain the data. In addition, for situations where a valid UCL cannot be calculated for the data set, an explanation of what will be used as the EPC should be included.	This data was not available at time of the development of the memo but was incorporated into the Draft HHRA.
19.	20		Duplicates are for quality assurance and should only be included in the data set once. Please specify that only one result of the primary and duplicate will be used for statistical analysis.	Field duplicates were not used as independent samples in the 95% calculations. Consistent with ADEC requirements (ADEC 2008), the highest concentrations between duplicate and original samples were used in the risk assessment.
20.	20		EPA is still unclear as to the correct approach for characterizing exposure units. Maps of contaminant concentration values with color coding to allow for visualization of concentration gradients should be provided. There are vast differences in the range of concentrations observed for the various contaminants present at the mine.	This issue was further discussed in the HHRA.