

DEC's comments/recommendations on: U.S. Environmental Protection Agency (EPA) Comments (dated 7 July 2005) on the DMTS Fugitive Dust Risk Assessment Prepared by Exponent for Teck Cominco Alaska Incorporated (dated April 2005).

No.	Comment	Priority	Recommendation
EPA-1	<p><b>Exposure Areas</b></p> <p>The DTMS includes 52 miles of road corridor and the port facility. In such a large study area, it is reasonable for people, especially children, to be primarily exposed to smaller portions of the site. At a minimum, EPCs and associated risk estimates should be calculated separately for the port and the road corridor. The environmental setting and exposure point concentrations significantly differ between the port and the road. The potential exposure from the port area is inappropriately diluted by the overwhelming size of the road corridor.</p>	High	Please provide rationale for using only one EPC as opposed to the method proposed by EPA. In the uncertainty section of the human health RA, please indicate the magnitude of change in the risk estimates that would result for the port and haul road if the areas were evaluated separately versus combined.
EPA-2	<p><b>Misapplication of Fractional Intake to Large Home Range Species</b></p> <p>While the general approach of reducing exposure by the ratio of the site area to the larger exposure area is reasonable for non-mobile exposure media, it is not reasonable for caribou or Dolly Varden. These species are mobile and their body burden of metals reflects their use patterns which occur on and off-site. Although the tissue concentrations are not exclusively caused by site contamination, the unadjusted body burdens are representative of exposure to consumers. The relative contribution of site-related sources to these receptors should be addressed in the uncertainty discussion for these species. For other exposure media, where application of a 0.09 fractional intake term may be more appropriate, it is necessary to account for the remaining 91% of the exposures, assuming "market basket" or background exposures, because IEUBK inputs must account for all sources of exposure, regardless of site-related origin. Because blood levels are reflective of relatively short periods of exposure (acute to subchronic durations of weeks or months as opposed to years), the temporal uncertainties of fractional intake should be discussed. Higher levels of site-related subsistence are more likely to occur over shorter periods of time.</p>	High	Please address the issues raised, specifically the relative contribution of site-related sources to body burdens. Augment the uncertainty discussion as recommended by EPA. Revise the text as necessary so it is clear that site-related exposure were added to background exposures in the human health RA.
EPA-3	<p><b>Representativeness of Caribou Samples</b></p> <p>Exposure point concentrations of caribou do not reflect metal contributions from bone and bone marrow. Omitting of these tissue types is likely to underestimate exposure because bone and marrow are eaten by tribal consumers (Swan, 2005) and these tissues are likely to have higher levels of lead and other metals than other tissue types included in the laboratory analyses.</p>	Medium	Please address in the uncertainty section the potential underestimation of risk due to not including bone and marrow in the evaluation.

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EPA-4	<p><b>Representativeness of Berry Samples</b></p> <p>A tribal representative and community member has questioned the temporal and spatial representativeness of berry samples (Swan, 2005). Sample collection occurred during a year identified as particularly poor harvest (Swan, 2005). The timing of sample collection did not coincide with optimal gathering times defined by subsistence users (Swan, 2005). Additionally, sample locations accessed by helicopter are not representative locations readily accessible by Kivalina berry pickers (Swan, 2005).</p>	Medium	Please discuss the representativeness of the berry sampling with respect to actual subsistence berry collection in the area.
EPA-5	<p><b>Moisture content and water losses during cooking</b></p> <p>All of the contaminants of concern are metals, which are neither volatile nor lipophilic. Therefore, losses of moisture or fat which occur during heating would tend to concentrate metals. Exposure point concentrations should be adjusted to reflect moisture or fat content consistent with representative preparation techniques (Swan, 2005).</p>	Medium	Please discuss in the uncertainty section the effects of cooking and drying on metal concentrations in subsistence foods and to what extent risk may be underestimated if Swan's recommendation is not followed.
EPA-6	<p><b>Calculation of Site-Specific Lead Bioavailability</b></p> <p>The results of the rat feeding study indicate that galena ore concentrates from Red Dog Mine are likely to have lower bioavailability than most other forms of lead (Arnold &amp; Middaugh, 2001). However, juvenile swine are the preferred animal model for developing quantitative estimates of bioavailability as inputs into the EPA IEUBK Lead Model. The <i>Short Sheet: IEUBK Model Bioavailability Variable</i> states (U.S. Environmental Protection Agency Technical Review Workgroup for Lead, 1999):</p> <p style="padding-left: 40px;">Bioavailability data (other than from published studies using the juvenile swine model) that are intended for use in an EPA risk assessment using the IEUBK should be sent for review by the Office of Emergency and Remedial Response (now EPA Office of Superfund Remediation Technology Innovation (OSRTI)).</p> <p>Pending acceptance of the rat results, or acquisition of additional data, the risk assessment should rely on default measures of bioavailability. The likelihood of less than default bioavailability should be discussed in the uncertainty assessment. Additionally, because of its low initial solubility, powdered galena ore concentrate is likely to be transformed into forms with increased bioavailability as it oxidizes (Brown, Foster &amp; Ostergren, 1999).</p>	High	Please include a discussion of the uncertainty associated with the lead bioavailability values taken from Arnold and Middaugh 2001 in the main text. Please also discuss the possibility that galena can be oxidized to more soluble forms.

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EPA-7	<p><b>TRVs for Large Mammalian Ecological Receptors</b></p> <p>The use of results from a mouse study for the mammalian TRV for aluminum and results from a rat study for the mammalian TRV for Barium and applying this TRV to large mammals like moose and caribou seems inappropriate. Section 6.6.3.4 on Toxicity Reference Values included a thorough discussion of the background and uses of allometric scaling and briefly discusses how some of the HQ results would change but overall the majority of HQs would remain the same. This approach seems very reasonable when adjusting toxicity values from small animals to large mammals and a section that outlines the results and differences between standard TRVs and TRVs from allometric scaling would be helpful by including a table that would visualize those comparisons for CoPCs that demonstrated significant differences. Even though it may not change the overall conclusions, it would help the reader to see which CoPCs resulted in significant changes and a discussion of how it relates to ecological significance would be helpful.</p>	Low	Please include a table comparing scaled and un-scaled TRVs. Discuss the significant of TRV scaling on the conclusions of the ERA as requested by EPA.
EPA-8	Page 5-3. The fish EPC was based on Dolly Varden fillets, which may underestimate metals concentrations if other parts of the fish are consumed (Ay, Kalay <i>et al.</i> , 1999).	Medium	Please indicate in the uncertainty section that EPCs for fish may be underestimated if other parts of the fish are consumed.
EPA-9	Page 5-9. Drinking water exposure point concentrations should have been based on “end of tap samples” instead of unplumbed surface water. A weighted average of first draw and flushed samples is recommended for the input into the IEUBK Lead Model (U.S. Environmental Protection Agency, 2002).	Low	Please clearly indicate in the revised RA whether or not unplumbed surface water is used as drinking water at the site. The human health RA should use EPCs for surface water that reflect actual water use practices at the site.
EPA-10	<p>Page 5-12. Review fractional intake discussion.</p> <ul style="list-style-type: none"> <li>• Examine the assumption that all areas are equally likely to be used</li> <li>• Does DMTS road increase access and exposure to the site?</li> <li>• Do other site features (in addition to area) determine exposure likelihood or intensity (e.g., proximity to preferred areas, habitats, or migration routes)?</li> </ul>		Please revise the discussion as necessary to ensure that the questions in this comment are answered.
EPA-11	Table 5-11. Why aren't the sum of the species consumption rates equal to the class type totals? For example, land mammals are listed as 168 g/day, but the sum of caribou (155) and moose (35) is 190 g/day.	Low	Please correct any discrepancies.

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EPA-12	Table 5-14. For the sake of transparency, the fractional food intake term 0.09 should be included in all tables with intakes (5-14 and 5-18 through 5-38).	Low	Please make the appropriate changes.
EPA-13	Page 5-31. Although treated as policy/regulatory value by EPA and CDC, 10 µg/dL is not a biological threshold for adverse effects of lead (Centers for Disease Control and Prevention, 1991; B. P. Lanphear, Dietrich <i>et al.</i> , 2000; B .P. Lanphear, Canfield <i>et al.</i> , 2001; Canfield, Henderson <i>et al.</i> , 2003; Canfield, Kreher <i>et al.</i> , 2003).	Low	Please make the appropriate changes.
EPA-14	Page 5-33. Although, an adult soil ingestion rate of 100 mg/day would be likely to overestimate adult central tendency rates for the conventional occupational or residential scenarios in the Adult Lead Model, its application to a subsistence scenario is uncertain and could underestimate the contact rate. Adult soil ingestion rates encompass a large degree of uncertainty because the database is extremely small. Estimating soil ingestion associated with subsistence activities compounds this uncertainty, yet subsistence activities are typically associated with enhanced contact rates with environmental media (S. G. Harris & Harper, 1997; Simon, 1998; S. Harris & Harper, 2001; Harper, Flett <i>et al.</i> , 2002).	Medium	Please add a discussion of the limitation of the Lead Model to subsistence.
EPA-15	Page 5-40. Discussion concludes that caribou tissue metal concentrations are not indicative of excessive mine-related exposures – this may be true, but it conflicts with the use of the fractional intake term in the risk assessment.	Medium	Please resolve the potential conflict.
EPA-16	Page 6-9. The green winged teal was selected as the representative freshwater semi-aquatic avian herbivore. In the description the diet is listed and includes seeds, plant material, aquatic insects, mollusks and crustaceans. The percentage of each category of the diet should be listed and a discussion of why this species is a representative herbivore when its diet incorporates insects, mollusks and crustaceans should be included.	Medium	Please add the requested information and discussion.
EPA-17	Page 6-10. The muskrat was selected as the representative freshwater semi-aquatic mammalian herbivore; however, the animal's diet is described as occasionally including clams, frogs, shrimp and small fish. The percentage of each category of the diet should be listed and a discussion of why this species is a representative herbivore when its diet incorporates clams, frogs, shrimp and fish should be included.	Medium	Please add the requested information and discussion.
EPA-18	Page 6-24. Discussion of the environmental factors such as slope, topography, etc. that could be leading to differences in the plant community with distance from the road could be discussed in more detail/included in section 6.2.1.3.4.	Low	Please add the requested discussion.
EPA-19	Page 6-50. Include more detail on the results of the 10-day amphipod test, list the percentage survival for each sample location and discuss the level of survival of the negative control sediment for comparison.	Low	Please add the requested information. Please include a copy of the toxicity-testing lab report in an appendix.
EPA-20	Page 6-56. The assessment states that the green winged teal is known to eat some aquatic invertebrates but is predominantly herbivorous and represents stream and tundra pond avian herbivore populations. Include additional discussion of percentage of diet in teals that is	Low	See recommendation for comment EPA-16.

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	from invertebrates and discuss why it is appropriate for this species to represent aquatic herbivores.		
EPA-21	Page 8-1. Identify cadmium in caribou as the highest hazard quotient. State that the child hazard index for cadmium in caribou exceeds 1 when the fractional intake term is omitted.	Medium	Please revise the report as requested.

Key:

DEC = Department of Environmental Conservation (Alaska)

DMTS = DeLong Mountain regional Transportation System

EPA = U.S. Environmental Protection Agency

ERA = Ecological Risk Assessment

NA = Not Applicable

RA = Risk Assessment

TC =Teck Cominco

Notes:

1. Comments submitted U.S. EPA Region 10, 1200 Sixth Avenue, Seattle, Washington 98101. Comments generated by Marc Stifelman and Jean Zodrow, EPA Office of Environmental Assessment
2. See the original EPA comment letter for complete citations of cited literature.