

microns. Because the maximum predicted PM₁₀ impacts are due to fugitive dust sources with particulate emissions that are larger than PM_{2.5}, in EPA's judgment the PM_{2.5} impact would be considerably smaller than the PM₁₀ impact, to the extent that the PM_{2.5} NAAQS would not be exceeded. Based on these factors, the estimated PM_{2.5} concentration would be about 6.4 µg/m³ (0.116 × 55 µg/m³) which is much less than the NAAQS of 35 µg/m³. So, it is highly unlikely that the PM_{2.5} NAAQS is exceeded.

Moreover, both the 24-hour and annual average modeled PM₁₀ impacts of 24.5 µg/m³ and 6.0 µg/m³, respectively, are less than the PM_{2.5} NAAQS of 35 µg/m³ and 15 µg/m³, respectively. In addition, modeling has demonstrated that the ambient impacts decrease rapidly with distance to the degree that the impacts are minimal within a few kilometers outside the facility boundary. Therefore, the particulate impact from the facility would be insignificant at Kivalina, which is located approximately 80 km from the mining operations.

The State of Alaska has proposed to adopt the federal PM_{2.5} standard, although this has not yet been finalized. After adoption, the State will need to define appropriate implementation and permitting procedures that would apply to future air permitting actions at the Red Dog Mine. The mine would therefore be required to demonstrate compliance with the standard at the facility boundary, including, as appropriate, conducting dispersion modeling. If predicted levels exceeded the standard, additional control measures could be needed. EPA believes the analysis performed in the SEIS is reasonable based on the PM₁₀ data and what is known about the emissions sources. PM_{2.5} emissions modeling may be conducted in the future under ADEC's air permit.

U.S. Environmental Protection Agency (EPA) 1996. Letter from John S. Seitz, EPA OAQPS, to the Honorable Alan K. Simpson, U.S. Senate, of June 26, 1996.

Hoefler Consulting Group (Hoefler) 1998. Cominco Alaska Inc. – Red Dog Mine Production Rate Increase: Application for an AQC Construction Permit with PSD Review. June 26.

Response to Comment ID: BN.11

Emissions of nitric dioxide (NO₂) were indeed calculated (NO₂ is a constituent of NO_x; see NO_x emissions in Table 3.2-7). NO_x emissions for the proposed action and alternatives were modeled and the impacts are presented as NO₂ in Table 3.2-9 and discussed in the SEIS.

Response to Comment ID: BN.12

EPA has determined that the Northwest Arctic Borough is “unclassifiable/attainment” for PM_{2.5}, thus indicating that EPA has determined no public health risk exists within the Northwest Arctic Borough (including Kivalina) with respect to PM_{2.5}. See response to comment BN.10 above regarding the SEIS analysis of PM_{2.5}.

Response to Comment ID: BN.13

As documented in Section 3.5.2.2 of the Final SEIS, the samples collected at the Kivalina drinking water tank meet applicable human health standards. As further indicated in Section 3.5.3.2 of the Final SEIS, under Alternative B, the concentrations of metals and TDS would not change from current conditions at Kivalina's intake. The validity of the samples collected and analyzed by Teck is certified by the company under penalties of law for misreporting. Finally, the data reported for the Kivalina tank are generally consistent with upstream water quality for the Wulik River collected throughout the operating life of the mine.

EPA determined that it was not necessary (nor is it required) to perform the independent sampling and analysis of Kivalina's drinking water intake as suggested by the commenter since there is no information to suggest that Teck's sampling was inadequate.

Response to Comment ID: BN.14

EPA appreciates the information provided by the commenter. However, these data represent a single sample of an unspecified "white/gray" material in the intake. No documentation is provided to support the conclusion that this material originates from the Red Dog Mine discharge nor do the solids data necessarily correlate to water quality at the intake, which has consistently met applicable drinking water standards. In addition, there is no information provided to describe how the reverse osmosis unit from which the sample came was used. It is our understanding that some residents recycle the reverse osmosis brine back into the intake containers instead of disposing of the brine. This practice could result in precipitation of solids when mixed with the rest of the intake water.

As documented in the data presented in Section 3.5.2.2 of the Final SEIS, the minerals found in the solids sample occur naturally throughout the Wulik River watershed. The findings in the Final SEIS are based on a long record of data collection in the receiving waters and show that the discharge will not adversely affect the village drinking water supply. See also response to Comment BN.13.

Response to Comment ID: BN.15

The SEIS cited the human health and ecological risk assessment, which was drafted by Exponent for Teck and reviewed by the Alaska Department of Conservation as well as stakeholders in the region. Contrary to the commenter's interpretation, the risk assessment evaluated contamination from a range of sources, including water borne exposure, not simply "metals associated with the DTMS [sic] only."

Because surface water quality standards are not exceeded in the Wulik River (see Section 3.5 of the SEIS) and the discharge is greatly diluted by the time it reaches the Wulik River, the SEIS did not identify a concern that Wulik River fish are contaminated or identify a need to sample fish in the Wulik River

Response to Comment ID: BN.16

EPA identified two weaknesses with the Teck's human health risk assessment:

- 1) We believe that there was uncertainty due to the low numbers of caribou collected for tissue analysis.
- 2) We expressed dissatisfaction that the risk assessment relied upon estimates of exposure solely from the DMTS rather than the actual exposures that reflect what people actually consume. These issues are described on page 3-251 of the SEIS. In response to these uncertainties, EPA did not perform its own quantitative analysis of risk, rather we stated that risks would be higher by an order of magnitude, but the relative contribution from the DMTS is unknown.

We believe that additional analyses are needed, but these analyses require collection of additional caribou tissue data. EPA has identified the need to conduct this additional monitoring (SEIS Table 2.5-2). Teck has agreed to perform this monitoring under its Memorandum of

Understanding with ADEC. EPA has requested that ADEC enforce the additional caribou tissue sampling and analysis (December 16, 2008 letter to Rich Sundet, ADEC, from Patty McGrath, EPA).

However, despite uncertainties in the data and analysis, EPA does not suggest that caribou consumption should be avoided.

Response to Comment ID: BN.17

The SEIS discusses the effects of the operation on both caribou and fish in the subsistence discussion (sections 3.12.2.2, 3.12.2.5 and 3.12.3) and in the health section (section 3.13). Environmental justice is discussed in Section 3.18. We believe these discussions comply with EPA's NEPA and environmental justice guidance on evaluating impacts. The commenter fails to provide specific details on why they perceive these analyses violate NEPA or EPA's guidance.

Response to Comment ID: BN.18

The SEIS does not dismiss lead exposure. Rather, the SEIS provides the results of blood lead level (BLL) monitoring of Kivalina residents (pages 3-248 and 3-249 and Table 3.13-3). Please note that Table 3.13-3 compares the 2000 national average blood lead level of 1-5 year olds as 1.70 µg/dL with 1990 Kivalina 1-5 year olds, but in 1990 the national blood lead average was approximately double the 2000 level (Muntner, Menke, DeSalvo, Rabito & Batuman, 2005; United States. Environmental Protection Agency. Office of Children's Health Protection. & National Center for Environmental Economics (U.S.), 2003). We recognize that there is not baseline BLLs to compare with current BLLs. However, the BLLs are more similar to national averages than as stated in the SEIS. In addition, we reviewed Teck's human health risk assessment BLL estimates and agreed that Teck used the appropriate methodology and the results were well below EPA's current target level. The SEIS states that the target level of concern (10 µg/dl) may be revised downward and that there may be no safe level of blood lead. Therefore, there is some risk to Kivalina residents, but the SEIS analysis did not show that the risk was greater than that of the general population or attributable to the Red Dog Mine. We have encouraged Teck and other agencies to form a Stakeholder Participatory Monitoring and Review Committee (see Table 2.5-2) that could be used to monitor BLLs.

Muntner P, Menke A, DeSalvo KB, Rabito FA, Batuman V (2005) Continued decline in blood lead levels among adults in the United States: the National Health and Nutrition Examination Surveys. *Archives of internal medicine* 165: 2155-61
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=16217007

United States. Environmental Protection Agency. Office of Children's Health Protection., National Center for Environmental Economics (U.S.) (2003) *America's children and the environment : measures of contaminants, body burdens and illnesses*, 2nd edn. [Washington, D.C.?]: Office of Children's Health Protection National Center for Environmental Economics
<http://yosemite.epa.gov/ochp/ochpweb.nsf/content/publications.htm>

Response to Comment ID: BN-19

See response to comment BN.18.

Response to Comment ID: BN-20

EPA has evaluated a full range of alternatives and given the requisite hard look at a full range of resources, including subsistence, water quality, wildlife, and public health in the SEIS as required by NEPA. EPA has made a concerted effort to include and address in the SEIS the concerns raised by Kivalina residents during the scoping and SEIS meetings. In addition, the Kivalina IRA council participated as a cooperating agency, through the Maniilaq Association, and has had numerous opportunities to raise these issues from the beginning of the SEIS process.

Trustees for Alaska (Trustees)

November 9, 2009 letter from Carl Johnson (CJ), Trustees, to Patty McGrath, EPA, Cindi Godsey, EPA, and Tim Pilon, ADEC.

Response to Comment ID: CJ.01

EPA does not believe that the Native Village of Point Hope is directly impacted by the Red Dog Mine. See response to comment 42.011 in Appendix H of the Final SEIS. Nevertheless, in response to comments from Trustees on the Draft SEIS, EPA offered government-to-government consultation with the Native Village of Point Hope via letter and email on February 25, 2009. On June 3, 2009 the Point Hope Indian General Assistance Program coordinator sent an email requesting EPA's attendance at a meeting two days later. EPA was unable to attend the meeting and requested via phone (June 5) and email (July 17, 2009) that Point Hope provide alternate dates. To date there has been no response to that communication. EPA responded to each communication from Point Hope and disagrees that there has been a lack of follow-through. EPA has been and remains open to meeting with Point Hope via conference call.

Response to Comment ID: CJ.02

Responses to comments on the draft NPDES permit will be released with the final permit.

Response to Comment ID: CJ.03

NEPA does not list the six items noted in the comment as requirements that must be met on a project by project basis but rather overarching objectives of the legislation. NEPA's preceding section recognizes the need "to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." 42 U.S.C. § 4331(a). In addition, Council on Environmental Quality regulations include economic and technical considerations and agency statutory missions as relevant factors in determining a preference among alternatives. 40 C.F.R. 1505.2(b). In identifying the environmentally preferable alternative, EPA considered the complexity and limitations of how an operation like the Red Dog Mine may exist in "productive harmony" with nature and also the importance of the operation in fulfilling economic needs, which in turn support social needs of the region's residents.

We respectfully disagree that the no action alternative would create less risk to health and safety. The abrupt loss of income that would be experienced by the borough, Teck employees and NANA shareholders could have significant impacts on health and available medical and social services. Contrary to the implication in the comment, in general the subsistence lifestyle has continued through the operation of the mine to date and there is no indication that the future level of subsistence activity, except for caribou and beluga harvested by Kivalina, would increase or decrease under *any* of the alternatives (see Section 3.12). The environmentally preferable alternative could reduce impacts on Kivalina's harvest of caribou, as could the no action

alternative (Alternative A). The environmental aspects of the no action alternative would allow a 20-year head start on the process of mine closure and revegetation of the site compared to the other alternatives; however, in this case EPA has determined that Alternative C and its economic benefits that would indirectly maintain health and social aspects within the borough outweigh the environmental benefits gained under the no action alternative.

Response to Comment ID: CJ.04

The health impact analysis was drafted by health professionals intimately familiar with Native health issues in Alaska and the Maniilaq region using information that was available. Maniilaq represented the cooperating agency interest and responsibilities for nine of the Native communities within the region and played a major role in developing the public health analysis. Section 1.5 of the SEIS describes the significant issues that were raised during the SEIS scoping process. Significant health concerns were not discussed in oral and written comments received during the scoping process. Nevertheless, the SEIS includes a detailed, separate section on impacts to public health. See Section 3.13. Responses to Trustees' more specific comments on the health analysis are provided below.

Response to Comment ID: CJ.05

EPA agrees that there is a lack of baseline health data from the original EIS and it is not possible to construct that data base. Therefore, EPA utilized the existing data that was available, including information from the risk assessment, as well as from a variety of other sources, including the Alaska Department of Health and Social Services (ADHSS) and the Maniilaq Association. The health assessment addressed a wide range of potential sources of effects and includes ADHSS studies on heavy metals exposure, blood lead epidemiology, diabetes, and fetal alcohol syndrome. Overall, the evaluation included a range of issues including subsistence and health, social and psychological health (including injury), cancer, and pulmonary disease, in addition to the potential exposure to environmental contaminants. Also see response to Comment ID CJ.07.

Response to Comment ID: CJ.06

The statement quoted is true; no blood lead levels were collected prior to opening of the mine. However, the commenter overlooked the discussion immediately preceding the quoted SEIS statement. A discussion of biological monitoring of community members for lead is included on pages 3-248 and 3-249 of the Final SEIS. Table 3.13-3 of this section includes an assessment and comparison of blood lead levels based on data collected in 1990, 2004, and 2006.

Response to Comment ID: CJ.07

A report by the Alaska Division of Public Health noted that portions of the ACAT-funded study referenced in the comment contained errors of fact and incorrectly interpreted previous studies and recommendations (Alaska Community Action on Toxics' (ACAT) report: "*Red Dog and Subsistence. Analysis of Reports on Elevated Levels of Heavy Metals in Plants Used for Subsistence near Red Dog Mine, Alaska*" Evaluation and Response, Alaska Division of Public Health. July 19, 2004. Scott Arnold, Ph.D. and John P. Middaugh, M.D.). While the ACAT study was reviewed in the development of the SEIS analysis, it was not included as a reference. However, the SEIS does recognize that EPA's current target blood lead level (BLL) of 10 ug/dl may be revised downward in the future since "no level has yet been found that does not correlate with adverse health outcomes." See page 3-250 of the Final SEIS.

Response to Comment ID: CJ.08

Under current exposure scenarios, the human health risk assessment conducted by Teck determined that risks were below levels of concern. That does not mean that there is absolutely no risk to a particular individual, rather that we do not expect that there are adverse public health effects overall.

Response to Comment ID: CJ.09

The SEIS makes no effort to downplay the magnitude and extent of environmental contamination resulting from mining operations within the areas surrounding the mine, port and road as reflected in the lengthy discussions under the air, aquatic resources, vegetation, wildlife, and subsistence resource sections. We agree with the comment that there is an ecological risk to some wildlife. These impacts are fully disclosed in the SEIS and were a factor in EPA's identification of the environmentally preferable alternative.

The health assessment includes an analysis on the effects of exposure from environmental contaminants. The reference to the toxic release inventory data is misleading since even the ACAT document acknowledges that "by far most releases are from waste rock and tailings solids," so while these "releases" are reported, they are not uncontrolled but instead are addressed as part of the discussion of mine waste disposal. EPA reviewed each of the documents cited in developing the SEIS and the SEIS includes two of these documents as references. The discussions in the SEIS are not intended to be exhaustive in terms of the sources and fate of contaminants. The SEIS discloses the fact that the contamination exists and characterizes its nature and distribution. The SEIS describes the existing effects of contamination, including the potential risks to wildlife (e.g. voles and ptarmigan) living in the immediate vicinity of the road, as well as those that would be anticipated should the proposed action or alternatives be implemented. In doing so, EPA takes the necessary "hard look" required by NEPA.

Response to Comment ID: CJ.10

The SEIS cites CDC data because it is the data currently available. To our knowledge, there are no local studies of the specific sources of cadmium in residents. Since the Maniilaq Association, the local health provider, represented the interests of a number of tribal entities in the region and played a key role in development of the health impact assessment, EPA assumes that had such a study been available, it would have been included.

Response to Comment ID: CJ.11

The commenter misread the discussion of socioeconomic effects, although the economic benefit of the operation is not trivial. The Northwest Arctic Borough (NWAB) has received payments in lieu of taxes since operations at the mine began. Those payments support various NWAB programs, including the local school district. The commenter mischaracterizes the quoted statement in the SEIS, which spoke specifically about the installation of water and sewer infrastructure within the villages.

Response to Comment ID: CJ.12

Discharges under Alternative C would occur under the authorization of an NPDES permit. Teck does not plan to apply for the marine discharge NPDES permit until after the NPDES permit for the Middle Fork Red Dog Creek outfall is reissued. However, EPA evaluated the impacts of the marine discharge as part of Alternative C in the SEIS. Under Alternative C and any permit issued for the marine discharge, Alaska water quality standards would be achieved, although a small mixing zone of approximately 10 feet on a side may be required. Point Hope is more than 80

miles from where the outfall may be located at the port site. Marine mammals generally do not come in close contact with the port site. Even if marine mammals did enter into the mixing zone, their presence would be of an extremely short duration. SEIS sections 3.9 and 3.10 provide an analysis of impacts of a potential marine discharge on marine mammals and fish and concluded that there would be no adverse effect on marine mammals or fish in the vicinity of the outfall. Therefore, by extension, there would be no adverse effect on the health or subsistence activities of the residents of Point Hope.

Response to Comment ID: CJ.13

Health data at the village and regional level is limited by the small size of the populations and by federal privacy laws. The public health impact assessment was developed by health professionals under contract to the Maniilaq Association (the local health provider) and employed the most relevant data that could be obtained on a local, regional, and statewide basis. The commenter provides no suggestion or specific information as to what data they believe to be available or the additional analyses they believe could have been undertaken.

Response to Comment ID: CJ.14

We disagree with this comment. EPA required the collection of additional subsistence data and traditional knowledge to support the detailed subsistence analysis in the SEIS. The SEIS considers subsistence and socioeconomics along with the full range of other resources in support of the decision-making process. The SEIS documents that subsistence harvests have continued to occur through the mine's operation. While the analysis concludes that there have been likely effects from the mine on Kivalina's harvest of caribou and beluga, there is no indication that the mine is affecting subsistence harvest levels regionally or that the continued operation of the mine would result in "the end of the subsistence way of life in the area." See also response to comment JH.04.

Response to Comment ID: CJ.15

The commenter misinterprets the discussion of subsistence within the SEIS. As noted in previous responses, subsistence harvests, even by employees of the mine, have continued and are expected to continue into the future. The SEIS does not acknowledge the "likely adverse impacts on the subsistence way of life and culture of the Inupiaq people." Rather, it notes that localized effects on the harvests of caribou and beluga whale have likely occurred to the residents of Kivalina. While most residents of Kivalina are Inupiat, the SEIS does not conclude that operations at the Red Dog Mine would affect the Inupiaq people as a whole. Further, the initial projected life of the mine considered in the 1984 EIS was through 2031; therefore, the current proposal does not represent an extension of mining activities. Rather, closure of the mine under Alternative A would represent an early closure in terms of the initially anticipated duration of activities. Contrary to the implication in the comment EPA is meeting its responsibilities under Section 101 of NEPA. The subsistence impacts to Kivalina were one of the main reasons that EPA identified Alternative C as environmentally preferable.

Response to Comment ID: CJ-16

The commenter uses the response to Comment 7.021 out of context where EPA actually notes that these species were not considered in the *risk assessment* (emphasis added). The risk assessment process was a non-federal action conducted through the Alaska Department of Environmental Conservation as a separate process outside the NEPA process. Threatened and endangered species were identified by EPA and were considered in the SEIS analysis in sections