

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION DIVISION OF SPILL PREVENTION AND RESPONSE CONTAMINATED SITE PROGRAM

SARAH PALIN, GOVERNOR

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7578
Fax: (907) 269-7649
<http://www.state.ak.us/dec/>

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By Mail and Facsimile

June 19, 2009

Wayne Hall
Superintendent, Environmental
Teck Alaska Incorporated
Red Dog Operations
3105 Lakeshore Dr., Bldg. A, Suite 101
Anchorage, Alaska 99517

RE: Review Comments of Teck's "Draft Fugitive Dust Risk Management Plan Red Dog Operations, Alaska" dated August 2008

Dear Mr. Hall:

The Contaminated Sites Program (CSP) within the Department of Environmental Conservation (DEC), its term contractor Oasis Environmental, and its subcontractor Ecology & Environment have reviewed the August 2008 "Draft Fugitive Dust Risk Management Plan Red Dog Operations, Alaska" prepared by your consultant, Exponent. DEC received the draft plan via e-mail on August 26, 2008. As you are aware we posted the document on our webpage and public noticed the document between September 1 and October 15, 2008 several times each in the Anchorage Daily News, Fairbanks Daily News Miner and the Arctic Sounder. The plan specifies that six subplans would be submitted at a later date, i.e., a Communication Plan, a Dust Emissions Reduction Plan, a Remediation Plan, a Monitoring Plan, an Uncertainty Reduction Plan, and a Worker Dust Protection Plan.

CSP had requested the risk management plan as conditioned in its December 19, 2007 approval of Teck's "DMTS Fugitive Dust Risk Assessment Report" dated November 2007. DEC requested that the management plan address risks to ecological receptors that were identified in the risk assessment report. The risk assessment report did not identify any risks to human receptors.

The subject plan covers multiple regulatory programs related to fugitive dust and includes planned efforts to address:

- Effects of fugitive dust identified in Teck's November 2007 Delong Mountain Transportation System Fugitive Dust Risk Assessment for areas surrounding the mine boundary, road and port.

- Effects of fugitive dust within the mine's solid waste boundary, evaluated as part of the closure and reclamation planning process.
- Fugitive dust issues identified in the Memorandum of Understanding (MOU) between DEC and Teck.
- Fugitive dust considerations identified in the supplemental environmental impact statement (SEIS) for the Aqqaluk Pit Extension.

During the public notice period, we received comments from two parties (i.e., National Park Service and Northern Alaska Environmental Center). We also received comments from the Environmental Protection Agency (EPA) that were submitted shortly after the notice period ended. We previously sent you all three sets of comments. During the comment period, informational meetings regarding the subject plan were provided by Teck and Exponent at Kivalina and Noatak, which I attended.

On April 2, 2009, Exponent notified DEC and other stakeholders who attended your March 2008 informational workshop for the fugitive dust risk management plan (RMP) via e-mail that Teck would be developing a web portal to allow stakeholders to review and comment on the subplans. The e-mail also informed the stakeholders that Teck would be holding a 30 day comment period for the draft Communication Plan, i.e., until May 2, 2009.

Since the public notice period, we have discussed the draft plan. We have also discussed with EPA and you several of EPA's comments on the plan. During a teleconference with you and staff from Exponent on June 3, 2009, you informed DEC that the remaining draft subplans would be available for DEC review by October 1, 2009 (as noted earlier, the Communication Plan has been made available).

DEC has the following comments regarding the draft RMP. In addition, we are enclosing our review of the three stakeholder's comments. Lastly, we have no comments on the draft Communication Plan. Please note that DEC will post the draft subplans and final RMP and subplans on our webpage at <http://www.dec.state.ak.us/spar/csp/sites/reddog.htm>. DEC may also elect to public notice one or more of the subplans, e.g., monitoring, such as we did for the draft RMP.

1. Goal, Objectives, and Future Actions. The Draft RMP addresses dust-related issues identified in: (1) the final Delong Mountain Regional Transportation System (DMTS) risk assessment (Exponent 2007a); (2) the mine area ecological risk evaluation conducted as part of the closure and reclamation planning process (Exponent 2007b); (3) a 2007 Memorandum of Understanding (MOU) between the Alaska DEC and TC (DEC 2007); (4) the Supplemental Environmental Impact Statement (SEIS) for the Aqqalak Pit Extension; and (5) the risk management workshop held in Kotzebue, AK in March 2008 (Teck Cominco 2008). Based on issues identified in items 1 to 5 above, an overall goal, seven objectives, and dozens of potential actions for risk management were identified.

- The overall risk-management goal identified in the Draft RMP is to *Minimize risk to human health and the environment surrounding the DMTS and Red Dog Mine over the life of the mine and post-closure operations.*

- The seven objectives to be addressed by risk management actions at the site are: (1) continue reducing fugitive metals emissions and dust emissions; (2) conduct remediation or reclamation in selected areas; (3) verify continued safety of caribou, other representative subsistence foods, and water; (4) monitor conditions in various ecological environments and habitats, and implement corrective measures when action levels are triggered; (5) conduct research or studies to reduce uncertainties in the assessment of effects to humans and the environment; (6) improve communication and collaboration among all stakeholders; and (7) protect worker health.
- Potential actions that could be used to address the objectives were identified and ranked based on effectiveness, implementability, level of effort needed for implementation, and stakeholder preference. Dozens of potential actions were identified (see Tables 1 to 8 in Draft RMP).

In DEC's judgment, the goal, objectives, potential actions, and ranking procedure presented in the Draft RMP are appropriately comprehensive and acceptable for the site.

2. Future Steps. The Draft RMP represents an initial step in the risk management planning process for the site, not a completed plan. The specifics regarding precisely what will be done to better understand and manage site risks are deferred to implementation plans that are being drafted by Teck for release in 2009.

In DEC's judgment, the approach by Teck to submit a general RMP and more detailed plans is acceptable for the site.

SPECIFIC COMMENTS

Section 2.3.3.2. The Draft RMP indicates, "Overall, estimated [human health] risks were well within acceptable public health limits." Public health limits should be defined. It may be more appropriate to characterize the estimates on human health risk as being within acceptable regulatory limits.

Section 2.3.3.4. The Alaska Department of Fish and Game Bearded Seal (Ugruk) Assessment was not included in the *DMTS Fugitive Dust Risk Assessment* (Exponent 2007a). The description of the study and results were not substantiated by DEC.

Section 2.3.4.5. How areas inside ambient air boundaries are kept off limits to subsistence use should be further defined. Through numerous meetings and discussions during development of the risk assessment it became apparent areas within ambient air boundaries were being used for subsistence activities even though access was not granted. Controls currently in-place to make these areas off limits is important to mention. Additional institutional controls may be recommended to further limit access.

Section 2.3.5. References or a discussion on how values were determined should be added to this section. It is unclear if these are the authors' opinion or were obtained through some other method.

Section 5 or 6. A schedule for preparation and review of the implementation plans should be provided in Section 5 (*Implementation of Actions*) or Section 6 (*Review and Reporting*). More detail on specific action items and schedule are needed throughout the Draft RMP and, specifically, in Section 5 and 6. Section 8.1 of the *DMTS Fugitive Dust Risk Assessment* (Exponent 2007a) indicated this information would be provided in the risk management plan. As we understand in discussions with you and Scott Shock of Exponent, these specific action items and schedules may be included into the specific six subplans.

Section 5.4.2.2 and 5.5.2.2. The list of items identified in the final response-to-comment tables as needing further evaluation in the RMP should be compiled and included in the RMP for easy reference. DEC's compilation of these issues are included as an attachment to this letter.

As we have discussed, please provide the remaining five draft subplans of the RMP by October 1, 2009.

If you have any questions regarding this letter, please do not hesitate to contact me at 907-269-7578.

Sincerely,



Rich Sundet
Project Manager

Encls.: As stated

Ccs/w/encls.

cc: Scott Shock, Exponent, Bellevue, WA (by mail and facsimile)
Mark Schimschiemer, P.E., AIDEA, Anchorage
Sean Halloran, Hartig, Rhodes, Hoge & Lekisch, Anchorage
Paul Glavinovich, Nana Corporation, Anchorage
Marc Stifelman, EPA Region X, Seattle OEA-095
Patricia McGrath, EPA Region X, Seattle OWW-135
Zak Richter, Northern Alaska Environmental Center, Fairbanks
Mike Frank, Trustees for Alaska, Anchorage
Amy Crook, Center for Science in Public Participation, Victoria, British Columbia
Robert Winfree, National Park Service, Anchorage
George Helfrich, National Park Service, Western Arctic National Parklands, Kotzebue

Marty Brewer, DEC, Anchorage
Tim Pilon, DEC, Fairbanks
Alice Edwards, Acting Director Air Quality Division, Anchorage
John DiMarchi, DNR, Fairbanks
Cam Leonard, SOA Dept. of Law, Fairbanks
Krista Graham, Oasis, Anchorage
Joseph Luther, Native Village of Noatak President IRA
Susie Page, IGAP, Noatak
Herbert Walton, Native Village of Noatak IRA
Lowell Sage, Jr., Native Village of Kivalina IRA
Colleen Swan, Native Village of Kivalina IRA
Bert Adams, Sr., City of Kivalina
Millie Hawley, IGAP, Kivalina
Walter Sampson, NANA, Kotzebue
Tom Okleasik, NW Arctic Borough, Kotzebue
Jackie Hall, Maniilaq Assn., Kotzebue
Vanessa Salinas, Alaskans for Responsible Mining, Anchorage
Rosie Barr, NANA, Anchorage
Pam Miller, Alaska Community Action on Toxics, Anchorage
Lori Verbrugge, Alaska Department of Public Health, Anchorage

Draft DMTS Fugitive Dust Risk Assessment Comment Resolution - Summary of Issues Deferred to Risk Management Plan (RMP)

	Comment No.	Issue	RMP Reference
1	DEC Eco-8	Assessment of pond vegetation .	Consider collecting unwashed and washed plant tissue samples to assess the contributions of external and internal metals to total metals concentrations in plants.
2	DEC Eco-14, NPS-1, NPS-21	Selection of background locations .	<p>During development of the Risk Management Plan, the risk assessment results can be used to prioritize future actions such as additional data collection or monitoring.</p> <p>The possible need for additional study to further address the uncertainties in selection of the background locations will be considered. Appropriate reference station locations, sample size requirements and landcover class designations will be considered in the design of future monitoring studies.</p>
3	DEC HHRA-26	Action levels were not calculated in the risk assessment.	Action levels based on human health were not calculated because there were no elevated human health risk estimates. Because hazard indices were above 1 for some ecological receptors, the use of action levels will be evaluated in the risk management plan.
4	NPS-2, NPS-16, NPS-43, NPS-55, NPS-60, NPS-87, NPS-88, NPS-89, NPS-90, NPS-91, NPS-104	<p>Review the existing literature on the toxicological effects of metals on lichen and non-vascular plants in the revised ecological risk assessment (ERA). More detailed lichen studies in future monitoring work at the site should be discussed.</p> <p>Consider conducting studies to identify threshold concentrations for nonvascular species as part of future monitoring studies at the site.</p>	<p>The need for future study of plant communities (including lichen and bryophyte species) will be evaluated during development of the risk management plan.</p> <p>The risk management plan will define what actions need to be taken based on the findings of the DeLong Mountain Regional Transportation System (DMTS) risk assessment.</p>
5	NPS-5	The ERA should be revised to address additive impacts (especially for wildlife), effects beyond 1000 m from the haul road, and possible effects to non-benchmark species.	There is an indication that effects to lichens extend beyond 1,000 m from the road, but the distance over which these effects may be occurring is unknown, and may need to be evaluated as a component of any

	Comment No.	Issue	RMP Reference
			<p>planned monitoring studies.</p> <p>The need for future studies (e.g., for lichens and mosses) will be evaluated during development of the risk management plan.</p>
6	NPS-6, NPS-19, NPS-20, NPS-68	<p>General. The revised ERA should indicate that adverse effect thresholds have been exceeded for several receptor groups and that action is needed to further reduce fugitive dust emissions.</p> <p>Corrective actions should be considered for inclusion in the risk management plan.</p>	<p>Further actions to address the findings of the risk assessment would be identified through the development of a risk management plan, which will “evaluate risk management options within the general categories of institutional controls, engineering controls, monitoring, and remediation/restoration... [and] identify the most appropriate combination of actions for management of risk in the short-term, and over the long-term life of the mine.”</p> <p>The requirements of the easement agreement will be considered in identifying additional action items during development of the risk management plan.</p>
7	NPS-7, NPS-90, USGS-12	Future monitoring work should include studies to evaluate possible acute impacts during snowmelt.	The possible need for future studies will be evaluated during development of the risk management plan.
8	NPS-8, NPS-21, NPS-84, NPS-86, NPS-101, USGS-5	Include more detailed vegetation analysis of more landcover types in future monitoring studies.	<p>Further study would be required to delineate the full nature and extent of vegetation effects. The need for future studies will be evaluated during development of the risk management plan.</p> <p>The need for future study of plant communities (including speciation of moss and lichen species) will be considered during development of the risk management plan.</p>
9	NPS-24, USGS-2, USGS-20	Limited data available within NPS-managed public lands.	<p>The possible need for future studies within NPS-managed lands will be considered during development of the risk management plan.</p> <p>Additional studies designed to minimize outstanding uncertainties will be considered during development of</p>

	Comment No.	Issue	RMP Reference
			the risk management plan. Results of any supplemental studies would provide additional information for the Park Service to use in managing their resources.
10	NPS-47	Representative marine mammal such as ugruk (bearded seal) or beluga whale should be added to the list of subsistence foods important in the area.	The possible need for future studies in the marine environment will be evaluated during development of the risk management plan.
11	NPS-57	Additional discussion regarding the importance of lead in the marine environment near the loading terminal and how it was evaluated in the baseline ERA is needed.	All sediment compounds of potential concern (CoPC) concentrations (including lead) have been below all screening criteria in the sampling events conducted in the years since the port shiploader upgrades were completed. However, some level of ongoing monitoring is warranted. The appropriate frequency for future monitoring in the marine environment will be evaluated during development of the risk management plan.
12	NPS-61	Consider collecting updated subsistence use data as part of future monitoring work at the site.	The appropriate degree of future monitoring of subsistence foods will be evaluated during development of the risk management plan.
13	NPS-64, NPS-96	In future monitoring work, consider collecting additional ptarmigan samples further from the site.	Monitoring of ptarmigan will be considered during development of the risk management plan.
14	USGS-4	<p>Biomarker and other measures of sublethal impacts may provide weight-of-evidence information about receptors and pathways and "ground truth" the findings of risk assessments because sub-lethal chronic effects are difficult to predict from COPC analysis and risk assessment modeling exercises. Within the context of developing monitoring plans amenable to long-term management goals envisioned by the Park Service, selected biomarkers complementary to those measures of effect could serve as sensitive indicators of effects that may develop through time.</p> <p>The risk management plan should focus on those components of the system at risk by addressing questions related to bioavailability and undervalued</p>	The need for future study of vegetation and soil communities, and bioavailability, will be evaluated during development of the risk management plan. The risk management plan will define what actions need to be taken based on the findings of the DMTS risk assessment, thereby focusing priorities where the greatest potential risks were predicted.

	Comment No.	Issue	RMP Reference
		resources such as soils and vegetation. In addition, comparison of toxicity and differential bioavailability of ore concentrates versus weathered mineral outcroppings could help differentiate mining inputs from ambient environmental exposures, if studies were designed to address the question. Such studies could also provide insight as to pathways of ore concentrates to biological receptors, and serve to refine exposure models employed in the food-chain analysis captured in the RA.	
15	USGS-6	Addressing uncertainty in the ERA.	Possible actions to address identified areas of risk and uncertainty will be considered during development of the risk management plan, and future work that follows from that plan (e.g., monitoring) will help to provide a more accurate evaluation of risk to ecological receptors.
16	USGS-9	Presumed confounding effects of dust versus metals could be resolved if soil characteristics are considered.	The possible need for additional work to evaluate this will be considered during development of the risk management plan.

	Comment No.	Issue	RMP Reference
17	USGS-13	Assumptions about metal residues in biota were largely based on limited samples of resident biota . Small sample sizes could result in a high degree of variability that may obscure differences in residue concentrations between organisms from exposed and reference sites.	The possible need for additional data collection to address areas of uncertainty will be considered during development of the risk management plan.
18	USGS-17	The sampling of biota and substrates within the Cape Krusenstern National Monument (CAKR) was limited, and information generated by NPS studies was not considered in this RA, thus estimates on the status of metals contamination to habitat and biota of CAKR are based on very limited data.	The possible need for future studies within the CAKR will be considered during development of the risk management plan.
19	USGS-19, USGS-31	Wildlife Use Patterns. Uptake may also be assumed to be spatially random, when in fact there may be preferential factors that attract organisms to contaminated sites. The roadside may provide some attraction for wildlife.	Further evaluation of wildlife usage patterns associated with the road (as they pertain to wildlife exposure estimates) may be warranted, and will be considered during development of the risk management plan.
20	USGS-34	Historical documents and land-lease agreements explicitly state the responsibility of Teck Cominco Alaska to minimize environmental impacts from Red Dog mine operations . Consequently, the development of a Risk Management Plan specific to this operation is needed. Considerable improvements in reducing fugitive dusts have been made, particularly at the port site, but there is no evidence or	Possible actions to further reduce emissions during transport and storage of concentrates, to assess the effectiveness of control measures, and to address risks identified in the risk assessment will be considered and outlined during development of the risk management plan.

	Comment No.	Issue	RMP Reference
		documentation that allows a quantitative assessment of these changes. Because it is not feasible to remove fugitive ore concentrate residues from haul trucks during the bulk of the year, a more efficient, less contaminating means for transferring concentrates or other methods of decontamination should be considered. Ecological risks are likely to increase from cumulative effects of COPCs if even low-level escapement of ore concentrates is allowed to continue.	
21	EPA-4	Please discuss the representativeness of the berry sampling with respect to actual subsistence berry collection in the area.	Future monitoring of berries will be addressed in development of the Risk Management Plan.
22	T/P-1	The risk assessment does not model sediment transport from the DMTS road or port site. Since the majority of metals move by sediment transport, the assessment must demonstrate how the streams carry loads and give a reasonable estimate of the rate of movement. The long-term risk then can be estimated by knowing the spread of contamination throughout the watersheds.	Modeling of future conditions could be considered as a possible approach to addressing uncertainties in the risk assessment, and can be considered during development of the risk management plan.
23	Peplow-1	The RA should more effectively utilize appropriate biological indicators in conjunction with chemical assessment.	The need for additional study of biological indicators will be evaluated during development of the risk management plan. The risk management plan will define what actions will be taken based on the findings of the DMTS risk assessment, thereby focusing priorities where potential risks were predicted.
24	Public Meeting Comment	Suggest that you test the bone marrow from the animals.	Continued caribou monitoring will be evaluated as part of the risk management plan. Bone marrow lead is likely to have very little impact on risk estimates but the relative merits of evaluating bone marrow lead will be considered when developing the risk management plan.
25	Public Meeting	Bioavailability. The NPS and DEC had some	The possible need for additional bioavailability studies

	Comment No.	Issue	RMP Reference
	Comment	previous comment that the metals were not totally unbioavailable. The commenter would like to see some more studies occur on this issue.	will be considered during the development of the risk management plan.
26	Public Meeting Comment	What about the water? Teck Cominco performs monitoring on Kivalina's drinking water and so does EPA and DEC. All the results show that the water that you use for drinking is safe.	Teck Cominco had indicated that they could sample Umayutsiak Creek. This has not been done at this point. Sampling of additional creeks can be considered during development of the risk management plan.
27	Public Meeting Comment	Topic: Risk Management Plan The National Park Service, DEC, and others were invited to come back to talk with the communities prior to making a decision at the site. A comment was received that those agencies are talking for the community members but they would like to know what the decision makers are thinking before determining the risk management decision.	The draft risk management plan will be developed with input from the Subsistence Committee. This Committee was set up under the Operating Agreement between the NANA Regional Corporation and Teck Cominco Alaska Incorporated and is the recognized vehicle for communication between local communities and Red Dog. The Committee is comprised of eight individuals (four each from Kivalina and Noatak) who periodically meet with mine officials to discuss subsistence and environmental topics. In addition, mine officials periodically hold public meetings in Noatak and Kivalina. Using these venues, the draft risk management plan will be presented and feedback will be requested.
28	Public Meeting Comment	The dust – risk assessment – can it be done from the barge to the ships and studies on the ships to where they came from? Also, does the dust from the Concentrate Storage Building go blowing to the ocean during winter season? Can there be studies done on that?	Dust emissions controls at the port have been improved in recent years, further reducing the inputs to the marine environment. Ongoing monitoring is likely to be conducted at an appropriate frequency. This will be identified during the development of the risk management plan.
29	Public Meeting Comment	Topic: Animal Deformities Skinny foxes without tails have been observed in the plume area. Teck Cominco should consider collecting and analyzing tissues from such animals.	The possible need for analysis of foxes will be considered during development of the risk management plan.

Summary of Public Comments on the *Draft Fugitive Dust Risk Management Plan Red Dog Operations, Alaska (August 2008)*

No.	Comment	Priority	Recommendation
Comments from George Helfrich, National Park Service dated October 8, 2008			
NPS-1	...overall we find the plan constructive and filled with a number of good ideas to mitigate and monitor impacts	Low	Noted.
NPS-2	General Comment: There is a great deal of content in the tables at the back that would be good to incorporate in the middle of the document because it comprises the meat of the potential actions	High	No commitment on specific actions is included in the <i>Draft Fugitive Dust Risk Management Plan (FDRMP)</i> . Commitment appears to be postponed until development of the specific action or implementation plans. Recommend including actions to be taken by Teck from Table 1 into the text of the document. These issues can be further developed in specific implementation plans but the FDRMP should also include actions committed to by Teck.
NPS-3	<u>Table of Contents, Page iii, 5. Implementation of Actions:</u> Under 5.1.2, 5.4.2, 5.5.2, and 5.6.2 the document reads "Further Actions," but sections 5.2.2 and 5.3.2 read "Future Actions." Shouldn't they all read as "Future Actions," or is there an intended difference? If so, what is it?	Low	Recommend making sections consistently read, "Future Actions".
NPS-4	<u>Section 2.3.1, first paragraph.</u> It is true that natural mineralization occurs in numerous locations, but it may not be accurate to say that "strongly elevated" metal concentrations occur in many locations. Strongly is open to interpretation. Our own investigations have identified slightly to somewhat elevated concentrations (<110 mg/kg Zn) in the Wrench Creek and Nimiuktuk mineralized areas. We suggest you leave this interpretation out or else specify the range of elevations.	Low	Recommend removing the word "strongly".
NPS-5	<u>Section 2.3.3.1.</u> It is worth noting that Hasselbach et al. (2005) found that levels of Pb, Zn, Cd were elevated above baseline levels in all areas of the study area (DMTS out to 40 km) except those in the southern portions of Cape Krusenstern National Monument.	Medium	Recommend making mention of the Hasselbach et al. (2005) information regarding the extent of fugitive-dust transport in this section.
NPS-6	<u>Section 2.3.3.2 Risk Assessment, Page 9, Last sentence in first partial paragraph:</u> Though risks associated with harvest of subsistence foods in unrestricted areas near the DeLong Mountain Transportation System (DMTS) haul road are not elevated, what about risks associated with potential harvest of subsistence resources in the port and mine areas? These areas were	Low	The text of the FDRMP correctly indicates, "The results of the risk assessment, along with the results from the subsistence foods evaluations suggest that risks associated with continued harvesting of subsistence foods from the site, including in unrestricted areas near the DeLong Mountain Transportation System (DMTS), are not significantly elevated." Recommend

Summary of Public Comments on the Draft FDRMP

No.	Comment	Priority	Recommendation
	once subsistence harvest areas. What are the risks there, if any? Should potential subsistence users in the area be warned of the risks in these locations, even if they are posted as off-limits?		clarifying harvest area evaluated in the risk assessment or providing risk assessment reference with page or section number.
NPS-7	<p><u>Section 2.3.3.2 Risk Assessment, Page 9, Second paragraph:</u> This paragraph should detail the extent of effects to mosses and lichens observed from dusts along other arctic gravel roads to compare with those observed along the DMTS haul road. This would help in deciphering the additional effects of heavy metals dust on bryophytes.</p> <p>It is our understanding that the effects along the DMTS haul road are more extensive than along the older and more heavily traveled Dalton Highway (North Slope Haul Road) or Denali Park Road in Alaska. On the Dalton Highway, effects on vegetation are limited to <25 m, whereas effects along the DMTS haul road extend outward to 1000m. Furthermore, a report to NPS from ABR, Inc. indicates the dust palliative calcium chloride (CaCl) may increase the bio-availability of heavy metals.</p>	Medium	Recommend adding the requested information.
NPS-8	<p><u>Page 10, footnote.</u> Lichens are actually fungi; mosses are bryophytes. It is fine to refer to both in the broad sense as plants.</p>	Low	Please correct the footnote on page 10 accordingly.
NPS-9	<p><u>Section 2.3.3.4 Caribou Assessment</u> As noted before in the risk assessment review, the NPS points to the Arctic Monitoring and Assessment Program (AMAP) pollution report of 1998 for summary analyses of toxic effects of Pb and Cd on caribou. In general, Pb levels in the arctic are low, except near industrial hot spots like Norilsk, Russia and large mines. Pb can reside in human bone for 20 years (AMAP 1998, pg 393), and there is little reason to assume Pb would leave other mammal bones any faster. Cd is a larger concern for caribou tissue, and it concentrates in body tissues in the following order: kidney>liver>muscle (AMAP 1998, pg 409).</p>	Medium	Recommend adding discussion of Arctic Monitoring and Assessment Program (AMAP) studies in this section.
NPS-10	<p><u>Section 2.3.4.1 Cape Krusenstern, Page 16</u> The NPS Management Policies were first published in 1988, but they have been superseded by NPS Management Policies 2006.</p>	Low	Please change reference to 2006 NPS policy.
NPS-11	<p><u>Section 2.3.4.4 Mine Area MOU, Page 19, 2nd to Last Sentence</u> Delete "to take" after "taking".</p>	Low	Please make requested change.
NPS-12	<p><u>Section 3.2, Page 27.</u></p>	Medium	Recommend making requested change, per the comment.

Summary of Public Comments on the Draft FDRMP

No.	Comment	Priority	Recommendation
	<p>While the goal of minimizing a risk is a good one, in the case of vegetation we have already moved beyond risk into actual observed impacts. Minimizing "impacts" would be more descriptive for receptors that have already experienced injury/mortality.</p> <p>A possible rewrite: <i>Minimize current impacts to the environment and risk to human health and the ecosystem surrounding the DMTS and Red Dog Mine over the life of the mine and post-closure operations.</i></p>		
NPS-13	<p><u>Section 3.4.5.</u> Muskoxen in particular are an uncertainty that holds high interest for NPS. The Cape Krusenstern National Monument muskoxen herd has been declining steadily over the past decade for a variety of reasons. Given their sedentary nature, their consumption of large quantities of nonvascular plants adept at absorbing contaminants, and the large amount of droppings observed along the Tahinichok Mountains adjacent to the DMTS, we believe muskoxen deserve special attention.</p>	Medium	<p>Please consider possible reasons why the caribou may not be a completely satisfactory surrogate for the muskox and why follow-up work aimed specifically at evaluating the muskox may be informative. For example, although both caribou and muskoxen consume primarily nonvascular plants, caribou favor lichens whereas muskoxen favor mosses. To what extent might these dietary preferences affect exposure to dust-related metals? Can this be evaluated with existing data? Could there be any significant differences in site use between caribou and muskoxen that would result in different exposures for these species? Are these factors accounted for in the final ecological risk assessment? Some level of follow up evaluation should be considered to address the NPS concern for muskoxen, which has been stated on several different occasions.</p>
NPS-14	<p><u>Section 5.2.2.</u> The two most significant engineering controls from NPS's perspective would be a concentrate pipeline (best) or year-round truck wash (second best).</p> <p>TCAK is in the preliminary stages of preparing for a permit application for a wastewater pipeline along the DMTS haul road, 22 miles of which pass through Cape Krusenstern. The pipeline would have some impacts to NPS-managed land.</p> <p>We believe it would be in the public interest for TCAK to pursue an application for a concentrate pipeline as well. The second pipeline would</p>	High	<p>Recommend adding consideration of a concentrate pipeline to the FDRMP, in the text and Table 1, and to appropriate implementation plans. See recommendation for NPS-2 comment regarding specific actions.</p>

Summary of Public Comments on the Draft FDRMP

No.	Comment	Priority	Recommendation
	generally eliminate fugitive dust and cause few additional impacts.		
NPS-15	<p><u>Section 5.4.1.3.</u> It would be worth including willow ptarmigan in this monitoring as well because the species was considered borderline to "at risk" in the ERA, depending on location.</p>	Medium	Please indicate in your response that monitoring of lead and other metals in vegetation consumed by ptarmigan and other wildlife is identified as a future monitoring activity in Section 5.4.2.2, consistent with Section 8.1 of the final risk assessment report. Because Section 5.4.1.3 lists only ongoing monitoring activities, it does not appear that a revision to this section is warranted based on this comment.
NPS-16	<p><u>Section 5.4.1.1 Human Health</u> Under bullet one, is the monitoring periodic and systematic? Does the plan call for monitoring ptarmigan, moose, and muskoxen, which are more sedentary and less migratory? Does it call for monitoring Pb in mammal bones?</p> <p>Under bullet 2, Kivalina requested comprehensive blood monitoring, but only a small subset of the population was sampled. Is this adequate?</p>	Medium	<p>Please respond to this comment from the perspective of whether ptarmigan, moose, and muskoxen are potential subsistence foods and what the final human health risk assessment concluded regarding health risks from consuming these species.</p> <p>Recommend adding consideration of additional blood monitoring for residents in Kivalina and Noatak to the FDRMP. Recommend adding the word "limited" to bulleted list (i.e. "Limited Blood lead monitoring in residents of Kivalina and Noatak".)</p>
NPS-17	<p><u>Section 5.4.1.2 Ecological</u> Some studies indicate CaCl applications increase the availability of heavy metals. Is this being investigated?</p>	Medium	Recommend including any known studies on bioavailability of heavy metals in relation to calcium chloride application.
NPS-18	<p><u>Table 1.</u> There is no mention of a concentrate pipeline in this table under Engineering Controls. In addition, we suggest adding ptarmigan as a monitoring target.</p>	Medium	Recommend indicating in this table or elsewhere that chemical analysis of vegetation consumed by ptarmigan is planned and provides more useful information about potential risks to ptarmigan than analysis of the birds themselves.
NPS-19	<p><u>Table 1, Dust Monitoring</u> The list of potential actions should identify the dust particle sizes (PM-10 versus PM 2.5) and speciation (e.g. heavy metals components versus silica dust).</p>	Medium	Recommend adding analysis of particle size and speciation to Table 1. See recommendation to NPS-2 regarding specific actions.
NPS-20	<p><u>Table 6.</u> NPS requests additional work on resident muskoxen.</p>	Medium	See recommendation for comment NPS-13.
Comments from Zachary Richter, Northern Alaska Environmental Center dated October 14, 2008			
NAEC-1	1. The ecological/environmental context within which the risk management planning will be completed and decisions will be made, is	Medium	Please augment Section 2.3 accordingly to address this comment.

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	not included in section 2.3 <i>What is the context?</i> A comprehensive discussion of the ecological/environmental context independent from impacts and risks is fundamental to the Risk Management Plan Development. This discussion must present a comprehensive understanding of the ecology of habitats, animal populations, and ecosystems present in the region.		
NAEC-2	2. Wilderness is an important value which has not been included in section 2.3.5.1. The region can arguably be characterized as wilderness and habitats that exist at a wilderness level are essential for the animal populations in the region. In turn, these habitats and animal populations provide for the subsistence needs of local people. Based on the National Park Service moss studies, metal bioaccumulation in the Krusenstern ecosystem resulting from mining activities appears to be a significant potential long term threat to the viability of natural habitats and subsistence resources	Medium	The importance of wilderness in supporting the public values identified in Section 2.3.5 should be acknowledged.
NAEC-3	3. NAEC has concerns about the length of time required to generate more plans in light of the expansion of the mining effort at Red Dog and the impacts to nonvascular plants, ptarmigan, and small mammals. We request that draft risk management plans including potential actions to be included in this document.	High	Recommend including specific actions in FDRMP. If all actions are to be deferred to individual implementation plans (as is currently done in the FDRMP) provide timeline for development of implementation plans. Based on the June 3, 2009 teleconference with Teck, Exponent, and DEC, it is DEC's understanding that all plans will be submitted for DEC review by October 1, 2009.
NAEC-4	4. The overall goal of the Risk Management Plan should be to minimize risk and to mitigate effects of fugitive dust to human health and the environment. Since there have been documented impacts to ecological receptors efforts to minimize and mitigate these impacts is appropriate and should be stated in the overall goal.	Medium	Please augment the overall goal to include mitigation of effects.
NAEC-5	<p><u>Dust Emissions reduction plan</u></p> <p>Goal: To continue to evaluate, select, and implement effective dust control measures for reducing dust emissions at the mine, port, and along the road.</p> <p>Comments:</p> <ol style="list-style-type: none"> 1. Build a concentrate pipeline as a dust reduction measure. 2. Also build a year-round truck washing station at both the mine site 	High	Recommend adding consideration of a concentrate pipeline to the FDRMP, in the text and Table 1, and associated implementation plan. See recommendation for NPS-2 comment regarding specific actions.

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	and port which washes all vehicles prior to traveling the DMTS as a dust reduction measure.		
NAEC-6	<p>Remediation plan Goal: To define a consistent method for identifying and selecting affected areas and implementing remediation and/or reclamation.</p> <p>Comments:</p> <ol style="list-style-type: none"> 1. Establish action thresholds for metals. 1000 m concentrations in Hylocomium could be used as a "critical load": the concentration beyond which damage to ecosystem components occurs. 	Medium	Please acknowledge that the remediation plan will establish action thresholds for tundra vegetation and other receptors as appropriate based on the findings of the final ecological risk assessment (ERA).
NAEC-7	<p>Monitoring plan Goal: To monitor changes in dust emissions and deposition over time and space, using that information to: (1) assess the effectiveness of operational dust control actions, (2) evaluate the effects of the dust emissions on the environment and on human and ecological exposure, and (3) trigger additional actions where necessary.</p> <p>Comments:</p> <ol style="list-style-type: none"> 1. It is critical to develop monitoring plans amenable to long term management goals envisioned by the Park Service. This includes selection of relevant biota and endpoints as well as appropriate temporal and spatial sampling plans. This monitoring would also be useful in evaluating the success of dust management efforts. 2. Address the potential for increasing bioavailability of existing contaminants. 3. Measure the success of dust control efforts 4. The 2007 Risk Assessment included limited and questionable (having slightly enriched metals levels) reference sites that were used for comparisons. 5. Please include landscape-level spatial data reported by Hasselbach (2004) which was largely ignored in the 2007 RA. 6. Please adequately address lichens, which are particularly sensitive to metals exposure and are important food sources to many organisms, and have not been appropriately viewed as receptors. 7. Adequately measure the loss of lichen cover to species level and at 	Medium	Please indicate in the FDRMP that these comments and suggestions will be given meaningful considered during development of the monitoring plan.

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	<p>a great enough distances from the road to establish the full spatial extent of effects.</p> <p>8. Include adequate sample sizes and spatial coverage for measures of metal residues in biota.</p> <p>9. Whole-organisms have most often used for tissue analysis, which is a less sensitive means to identify exposure that "target" organs such as the liver, kidney, or bone.</p> <p>10. Include actual measures of sub-lethal or chronic effects in animals.</p> <p>11. Include measures of temporal (seasonal) variation, during snow melt for example, in acute metals exposure and bioavailability.</p>		
NAEC-8	<p><u>Uncertainty reduction plan</u> Goal: To identify and prioritize prospective research or studies to reduce uncertainties in the assessment of effects of fugitive dust to humans and the environment.</p> <p>Comments</p> <ol style="list-style-type: none"> 1. A major uncertainty that exists is the oxidation and fate of metal sulfides, particularly in regard to potential toxic effects of sulfates to non-vascular vegetation. 2. Another uncertainty exists with regards to the lack of measures of soil characteristics and their effect on the bioavailability of metals to plants and terrestrial organisms. 3. The toxicity benchmarks used for modeling risks in the 2007 RA do not account for differences in sensitivity associated with organisms unique to the arctic tundra, potentially critical life stages, additive effects, nor cumulative risks of multiple stressors. 4. Assessment of contamination in Noatak National Preserve. 5. Investigate bioconcentration of cadmium in willows. 6. Investigate adverse effects of Fugitive Dust to Musk Oxen. 7. Investigate the potential that the addition of CaCl as a palliative can increase the availability of heavy metals. 8. Investigate sublethal affects to Flora and Fauna. 	Medium	Please indicate that these comments and suggestions will be given meaningful considered during development of the uncertainty reduction plan.
Comments from Patty McGrath, Regional Mining Coordinator, United States Environmental Protection Agency dated December 16, 2008			
USEPA-1	The Draft FDRMP [Fugitive Dust Risk Management Plan] identifies numerous action items to control fugitive dust, remediate selected areas,	High	Recommend providing schedule for development of specific implementation plans. Recommend providing specific action

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	<p>verify the safety of subsistence foods and water, perform environmental monitoring, reduce uncertainties, and communicate and collaborate with stakeholders. However, many of the action items are very general and it is not clear which of the action items will be implemented, specifically how they will be implemented, or when this will occur. Instead six additional implementation plans are proposed to be developed, presumably to supply these details. No schedule is provided for development of the implementation plans.</p>		<p>items to be implemented by Teck in the FDRMP, including schedule for implementation, in the FDRMP. DEC's understanding is that implementation plans will be provided for review by October 1, 2009.</p>
<p>USEPA-2</p>	<p>It is surprising to us that the FDRMP does not address our concerns related to how the caribou data was used in the risk assessment and the need to resolve the uncertainties <i>related</i> to the data set and source attribution. EPA has raised these issues repeatedly. We request that the final FDRMP or the implementation plans include specific action items to address these issues.</p>	<p>High</p>	<p>It is DEC's understanding that these issues are still unresolved. DEC recommends addressing these issues immediately and including the resolution in the RMP.</p>
<p>USEPA-3</p>	<p>Our comments recommend action items and monitoring that we believe will be the most effective over the long-term in reducing impacts due to fugitive dust, addressing areas of uncertainty, monitoring effectiveness of dust control measures, and monitoring environmental trends. Our recommended action items are consistent with mitigation and monitoring measures that are a result of EPA's environmental impact analysis in the Red Dog Aqqaluk Draft SEIS. EPA's environmentally preferable alternative in the Draft SEIS includes replacing the concentrate haul trucks with a concentrate slurry pipeline. This would be the most effective way to greatly reduce future impacts from fugitive dust emissions.</p>	<p>High</p>	<p>Recommend adding consideration of a concentrate pipeline to the FDRMP, in the text and Table 1, and associated implementation plans. See recommendation for NPS-2 comment regarding specific actions.</p>
<p>USEPA-4</p>	<p>The State of Alaska is a cooperating agency on the Red Dog Aqqaluk Draft SEIS and we believe the SEIS analysis as well as the DMTS risk assessment and our comments on the risk assessment justify the need for the action items we identified. As a cooperating agency the State has provided input to EPA in developing the draft SEIS and we assume that the State will also utilize the SEIS analyses in its permitting and approval decisions for the Red Dog Mine. We request that the Alaska Department of Environmental Conservation (ADEC) develop an enforceable mechanism and schedule to ensure that Teck implements the FDRMP and implementation plans, including action items related to fugitive dust identified jointly in the draft SEIS and our attached comments. We would</p>	<p>High</p>	<p>Recommend including a schedule for delivery of all implementation plans in the RMP. It is DEC's understanding that all draft implementation plans will be provided for review by October 1, 2009.</p>

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	like to meet with ADEC and Teck and other agencies, as appropriate to discuss how the measures identified in the Draft SEIS and Draft FDRMP will be implemented.		
USEPA-5	Section I, Introduction, page I: According to the introduction, the draft Fugitive Dust Risk Management Plan (FDRMP) will address dust-related issues identified in the Supplemental Environmental Impact Statement (SEIS) for the Aqqaluk Pit Extension, as well as other documents. Please describe how dust-related issues identified in the SEIS will be included in the FDRMP. The draft SEIS identified impacts to vegetation, wetlands, ptarmigan, and small mammals due to fugitive dust from Red Dog Mine operations. The draft SEIS identified uncertainties related to dust impacts to fish in creeks near the DMTS and caribou data used in the risk assessment. As a result, the Draft SEIS includes recommended monitoring and mitigation measures in addition to the ongoing work by Teck Cominco Alaska, Inc (Teck) to address fugitive dust. EPA recommends that Teck implement the monitoring and mitigation identified in the draft SEIS. See also the last comment below.	High	Please note and address comment.
USEPA-6	<p><u>Section 2.3.3.2, Risk Assessment, page 9, paragraph 1:</u> EPA has submitted comments on the DeLong Mountain Regional Transportation System (DMTS) Risk Assessment, the DMTS Risk Assessment Response to Comments, and on the Supplemental Assessment Response to EPA's Follow-up Comments that describe our ongoing concerns with how the caribou data was utilized and described in the human health risk assessment. These concerns have not been adequately addressed in the Supplemental Assessment Response and carryover into the FDRMP risk assessment summary. To reiterate,</p> <p>(1) Because of the small numbers of animals studied and the variability in metals concentrations in animals from all of the areas assessed, the caribou data is not useful to determine if caribou metals concentrations differ among the DMTS area and other locations in Northern Alaska or Canada. The data appear to show little difference. But this is not statistically supported, so the conclusive statement that there is no difference between caribou metals concentrations at Red Dog and other areas of the Arctic are not accurate without an acknowledgement of the</p>	High	See recommendation for USEPA-2.

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	<p>data uncertainty.</p> <p>(2) The human health risk assessment focused on exposures to site-related metals, but the source of the metals in caribou tissue is not known. A fractional intake of 100 percent represents the best estimate of actual exposure of people who consume caribou regardless of the source of the metals. Because of uncertainty regarding the true site contribution to caribou tissue metals concentrations, EPA advises the use of a fractional intake of 100 percent. It is critical to acknowledge the actual risk and that the uncertainty is due to source attribution.</p>		
USEPA-7	<p><u>Section 2.3.3.2: Risk Assessment, page 9, paragraph 2:</u> This paragraph summarizes the results of the ecological risk assessment and concludes that there is risk to ptarmigan. The ecological risk assessment also identified a risk to small mammals (shrews and voles) and that overwintering caribou have higher estimated exposures. These results should also be presented in this paragraph.</p> <p>The FDRMP states that it is not clear to what extent changes are a result of fugitive dust and physical effects typical of dust from gravel roads in Alaska. The draft SEIS compared contamination adjacent to the DMTS road to studies of the Dalton Highway and concluded that effects nearer to the road are in part due to general effects of road dust. The draft SEIS also identified that mining operations have had a significant effect on levels and distribution of fugitive dust, due to the fact that the highest metal concentrations appear near the mine, road, and port and decrease with distance.</p>	High	<p>Please ensure that wildlife risks identified in the final ERA are accurately and completely summarized in this section of the revised FDRMP. Please also augment the discussion regarding the possible causes (general road effects versus metals) of observed impacts to tundra vegetation. For example, Section 6.6.4.3 of the final ERA states the following: <i>Physical factors are likely to exert their greatest influence near the road and port facilities where dust deposition is greatest and drainage may be locally altered. Chemical factors (elevated metals and pH) are likely to become more important than physical factors at greater distances from dust sources, but are also likely to be a significant factor in changes observed near the road and port.</i> Consider adding a statement to this effect to this section.</p>
USEPA-8	<p><u>Section 2.3.3.2, Risk Assessment, page 11, paragraph 1:</u> This paragraph states there were comments received on the risk assessment related to uncertainty and that these issues "will be considered part of the context for development of the risk management plan and detailed implementation plans." It is not clear what "part of the context" means. This section should list the uncertainties identified in the risk assessment and by commentors. As discussed above, an area of uncertainty is that related to caribou monitoring and how the caribou data was used in the human health risk assessment. In addition, the ecological risk assessment</p>	High	<p>Please add a table to the revised FDRMP listing the issues identified in responses to comments to the DMTS risk assessment that were to be evaluated further in the risk management plan. Indicate how monitoring data will be used to address these uncertainties. Explain what is meant by "part of the context" and clarify the text of this section accordingly.</p>

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	indicated uncertainty related to effects on fish in some of the DMTS area streams. Another uncertainty is related to lack of data for large resident species such as muskoxen. The FDRMP should list the uncertainties and identify actions to collect information to reduce uncertainties. It is not clear how some of the general data collection identified in Table 6 relate to specific uncertainties identified in the studies and by commentators. This is an important part of the decision-making framework identified in Figure 2.		
USEPA-9	<u>Section 2.3.3.4, Caribou Assessment, page 14:</u> We are not convinced that enough data was collected to statistically compare concentrations in caribou harvested near Red Dog to other areas. Ongoing monitoring conducted by Teck and ADFG should seek to make a statistically significant comparison and also evaluate whether there are trends in the data.	High	See recommendation for USEPA-2.
USEPA-10	<u>Section 2.3.4.2, DEC Decision Framework, page 18, and Section 2.3.4.4, Mine Area MOU, page 19:</u> Please provide information on how the FDRMP and follow-up implementation plans will be enforced. Will ADEC approve the plans and a schedule for their completion? Will the data collected result in follow-up measures and how will follow-up actions be required? The FDRMP implies the approach will use the concept of adaptive management, but this is not described.	High	See recommendations for USEPA-1 and USEPA-4.
USEPA-11	<u>Section 3.4.3, Objective 3, page 31:</u> Some of the action items state that safe levels will be determined. More detail is needed on how these levels will be determined.	High	Please expand on this objective, as indicated in comment.
USEPA-12	<u>Section 3.4.4, Objective 4, page 33:</u> This section should describe the action levels that are referred to in the heading or describe how the action levels will be determined.	Medium	Please indicate (at least generally) how action levels will be determined and when and where they will be presented.
USEPA-13	<u>Section 3.4.5, Objective 5, page 34-35:</u> This section lists two areas of uncertainty. However, all areas of uncertainty should be listed so that it will be clear that actions have been developed to address them.	Medium	Please add a table listing areas of uncertainty that will be investigated and indicate what actions will be taken to address them.
USEPA-14	<u>Chapter 5, Implementation of Actions, pages 50-51:</u> The FDRMP identifies six additional plans that will be developed to meet the objectives laid out in the FDRMP. A schedule needs to be provided that describes when the plans will be developed, whether they will be developed concurrently, and when the tasks identified in the plans will be implemented.	High	Recommend providing schedule for development of specific implementation plans (i.e. draft documents provided for review by October 1, 2009). Recommend providing specific action items to be implemented by Teck in the FDRMP, including schedule for implementation, in the FDRMP.

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USEPA-15	<p><u>Chapter 5, page 50:</u> According to the FDRMP, the individual plans will incorporate as many of the individual prospective actions as can reasonably be implemented, with particular emphasis on those that are ranked more highly. It may be more effective to focus on the most highly effective actions, even if these are more difficult to implement, rather than overextending or raising expectations that as many actions as can reasonably be implemented, will be. It is not clear what is meant by "reasonably be implemented" and this could have different meanings to different individuals and agencies.</p>	High	Recommend providing specific action items to be implemented by Teck in the FDRMP, including schedule for implementation, in the FDRMP.
USEPA-16	<p><u>Tables 1 and 2:</u> Replacing concentrate haul trucks with a concentrate slurry pipeline was discussed during the risk management plan workshop in Kotzebue and was ranked by most of the table groups as very effective. The concentrate slurry pipeline should be included as an action item, since the information in the tables are meant to represent the results of that workshop. In addition, EPA believes that this would be the most effective means to reduce fugitive dust emissions related to concentrate transport. For this and other reasons, EPA has identified the concentrate pipeline as a component of the environmentally preferable alternative in the draft SEIS.</p>	High	Recommend adding consideration of a concentrate pipeline to the FDRMP, in the text and Tables 1 and 2, and associated implementation plans.
USEPA-17	<p><u>Tables 1 through 7:</u> Based on the analysis in the draft SEIS, EPA has identified a number of monitoring and mitigation measures that we believe are needed to address the impacts due to fugitive dust. These include the following:</p> <ul style="list-style-type: none"> • Install year around truck washes at both ends of the DMTS. • Implement an operational monitoring program to evaluate the effectiveness of dust control measures. • Evaluate the potential for changes in mobility and migration of metals from oxidation or other changes in forms of minerals. • Monitor health of local populations of voles, shrews, and ptarmigan. • Monitor the health of local populations of fish at DMTS crossings that tend to be resident in the area. • Develop and implement a monitoring plan to determine whether dust deposition from the Red Dog Mine is occurring within Noatak 	High	Recommend adding these issues for consideration in the FDRMP and associated implementation plans, to be submitted to DEC for review by October 1, 2009.

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	<p>National Preserve.</p> <ul style="list-style-type: none"> • Monitor changes in the vertical distribution of metals in surface tundra and underlying soils. • Monitor tissue concentrations in shrubs, herbaceous plants, mosses, and lichens to track rate of changes (1 year frequency). • Monitor composition of shrub, herbaceous, moss, and lichen communities to evaluate community health and identify changes in community composition. • Monitor remediated or reclaimed areas to ensure long-term effectiveness (at rollover sites and sites covered in risk assessment). Monitor metals concentrations in caribou. Recommend safe levels of consumption based on results of the caribou studies. <p>The risk assessment and SEIS analysis supports the need for the above measures and we recommend that these measures be carried forward into the FDRMP implementation plans. Some of these would not be needed if Teck decides to pursue the concentrate pipeline option, which is EPA's strong preference.</p> <p>The FDRMP implementation plans for the monitoring identified above needs to be more specific. For example, the endpoints used to monitor health of resident animal populations needs to be specified. .</p> <p>We support the general recommendations common to action items under many of the objectives including: use of traditional knowledge in developing study plans; develop standard methods for sampling, analysis and reporting; determine triggers for adjusting monitoring frequencies or contingency actions, and; displaying information on a spatial and temporal basis for trend identification.</p> <p>In addition, we support the communication and collaboration ideas in regards to the use of traditional knowledge, local monitors, village/mine liaison, and information sharing.</p>		

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Key:

AMAP = Arctic Monitoring and Assessment Program
DEC = Alaska Department of Environmental Conservation
DMTS = DeLong Mountain Transportation System
DNR = Alaska Department of Natural Resources
EPA = United States Environmental Protection Agency
ERA = Ecological Risk Assessment
FDRMP = Fugitive Dust Risk Management Plan
NPS = National Park Service