

**Pebble Project Preliminary Draft EIS
State Cooperating Agency Comments Table**

21-Dec-18

Department/Division/Section	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
DNR/DMLW/WATER-Alaska Hydrologic Survey	Sec3.17_Hydrogeology_FINAL & Sec4.17_Hydrogeology_FINAL			The groundwater MODFLOW model referred to in in Appendix 8.1J describes the model structure (layers in overburden, aquitards, and deep aquifers), the domain, and the calibration process (simulated vs observed GW levels from 2004-2007) but the GW model is not validated with a new dataset (e.g. data that is not used in the calibration step). Additionally, a sensitivity analysis must be performed to understand how model parameters affect model output. These results will be <u>particularly important</u> .	Conduct a validation analysis for the groundwater model by comparing modelled and observed piezometer levels for data collected post 2007 (outside the calibration period). Conduct a sensitivity analysis to understand the sensitivity of model results to model parameters. These additional modelling steps will provide greater understanding of the mining impacts on the groundwater systems, including pit dewatering as well as the impacts to groundwater-surface water interactions and flows.
DNR/DMLW/WATER-Alaska Hydrologic Survey	Sec3.17_Hydrogeology_FINAL & Appendix K3.17_Hydrogeology_FINAL			In section 3.17.1.4, it is stated that "Bedrock hydraulic conductivity generally decreases with depth" and Figs 3.17-13 and 3.17-14 are cited as results to support this statement. However, Figs 3.17-13 and 3.17-14 show a similar range of hydraulic conductivity with depth. Packer testing of the bedrock (Fig 3.17-13) shows a range of K from 1×10^{-7} to 1×10^{-5} , a similar range that is observed in the shallow aquifer systems.	Provide evidence to support the claim that hydraulic conductivity (K) decreases with depth. This decreasing K with depth concept is also a rationale for the dominance of local groundwater systems and a lack of regional groundwater system. Provide further evidence that regional groundwater systems do not exist.
DNR/DMLW/WATER-Alaska Hydrologic Survey	Sec4.17_Hydrogeology_FINAL			In section 4.17.2.1, it is stated that "the cone of depression would extend approx 2,000 to 10,000 feet from the crest of the open pit depending on the hydraulic character of the affected aquifers". This is a large range in the hydrologic impact from mining the pit. However, I can not see where the larger value (10,000 ft) is presented in the Piteau 2018a report.	Please clarify the basis for the 2,000 to 10,000 ft range in the cone of depression. What model parameters have the greatest influence on the cone of depression calculation? Has the range in the cone of depression been incorporated into the streamflow reduction calculations?
DNR/DMLW/RADS	Chapter 3 Affected Environment	3.2.2.2	3.2-8	Nushagak and Mulchatna Rivers Recreation Plan. The plan states that the Nushagak and Mulchatna Rivers Recreation Plan is superseded by the management intent of the 2013 Bristol Bay Area Plan revision (BBAP). However, on page 4-17 of the revised BBAP it states: "The Nushagak & Mulchatna Rivers Recreation Plan (RRMP) was developed by DNR and other entities to provide the basis for the management of recreation uses and structures on state land within the Nushagak and Mulchatna drainage basin... This plan revision continues the use of the RRMP as an element of the BBAP within the navigable waters of the Nushagak-Mulchatna drainage basin and those adjacent uplands designated as General Use (Gu), Public Recreation and Tourism dispersed (Rd), Public Recreation and Tourism Use Site (Rp), or (with these designations) co-designated Habitat for specific types of recreation activities and facilities.	Please correct the language in Section 3.2.2.2 with the lanaguage provided in the revised BBAP (Page 4-17), that states the RRMP's use is continued as an element of the BBAP. The RRMP has not been superseded.

[illegible]

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DNR/DPOR/OHA	3.8_HistoricProp	3.8	all of 3.8	Use of Appendix C: 36 CFR 800 are the implementing regulations for the National Historic Preservation Act. As a result of consultation for Section 106, it was determined that 36 CFR 800 are the appropriate regulations to follow for Section 106 compliance for the Pebble Project as USACE will be fulfilling collective responsibilities as lead federal agency.	Amend 3.8 to indicate that 36 CFR 800 will be followed for Section 106 compliance and revise this section to reflect 36 CFR 800 definitions and process.
DNR/DPOR/OHA	3.8_HistoricProp	3.8.1	3.8-1	No 2018 information - HDR and SRB&A conducted fieldwork in 2018.	Information from 2018 studies should be included in this section.
DNR/DPOR/OHA	3.8_HistoricProp	3.8.1	3.8-2	Section 106 consultation has produced new information about potential historic properties.	Include information gathered as a result of Section 106 consultation.
DNR/DPOR/OHA	3.8_HistoricProp	3.8	all of 3.8	Compliance under Section 106 will use Area of Potential Effect (APE) as USCG and BSEE need to use 36 CFR 800. Any reference to Permit Area will be for internal USACE use.	Use APE instead of Permit Area throughout section when talking about Section 106 compliance.
DNR/DPOR/OHA	3.8_HistoricProp	3.8.2	3.8-2 to 3	Compliance under Section 106 will use Area of Potential Effect (APE) as USCG and BSEE need to use 36 CFR 800. Any reference to Permit Area will be for internal USACE use.	Revise this section to define APE.
DNR/DPOR/OHA	3.8_HistoricProp	3.8.3	Alt. Discussion	These sections are only looking at the project footprint. The APE will at a minimum need to include an area outside of the project footprint to accommodate construction, maintenance, travel, staging, and accidental use (buffer).	Analysis of how many historic properties or potential historic properties may be impacted by each alternative will need to be revised once the APE has been determined and, if possible, once identification efforts and determinations of eligibility have been completed on potentially impacted historic properties.
DNR/DPOR/OHA	3.8_HistoricProp	3.8.3.3	3.8-3 to 4	References the 2018 HDR work, which was not included in the previous summary.	Include HDR's 2018 work in 3.8.1.
DNR/DPOR/OHA	3.8_HistoricProp	3.8.3.4	3.8-4	This section mentions the absence of information concerning marine archaeology, but does not mention the absence of information concerning on-land resources.	Clarify that only a small amount of the on-land natural gas pipeline corridor and transportation corridor has been surveyed.
DNR/DPOR/OHA	4.8_HistoricProp	4.8		Use of Appendix C: 36 CFR 800 are the implementing regulations for the National Historic Preservation Act. As a result of consultation for Section 106, it was determined that 36 CFR 800 are the appropriate regulations to follow for Section 106 compliance for the Pebble Project as USACE will be fulfilling collective responsibilities as lead federal agency.	Amend 3.8 to indicate that 36 CFR 800 will be followed for Section 106 compliance and revise this section to reflect 36 CFR 800 definitions and process.

DNR/DPOR/OHA	4.8_HistoricProp	4.8	Compliance under Section 106 will use Area of Potential Effect (APE) as USCG and BSEE need to use 36 CFR 800. Any reference to Permit Area will be for internal USACE use.	Revise this section to use APE instead of Permit Area.
DNR/DPOR/OHA	3.7_HistoricProp	3.7	Cultural resources cover a wider range of resources than historic properties and additional consideration for those resources may be necessary outside of the Section 106 process.	The Section 106 PA addresses historic properties and very rarely treats resources that are not eligible to the National Register of Historic Places. Recommend adding language and consideration of cultural resources that will not be historic properties under Section 106.

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DNR/DOG/SPCS	Appendix E - Laws, Permits, Approvals, and Consultations Required	Table E-1	E-16	text reads, "The ADNRR State Pipeline Coordinator's Office issues pipeline ROW leases for new pipeline and pipeline related construction..."	change name to State Pipeline Coordinator's Section (not "Office")
DNR/DOG/SPCS	Section 4.3 - SocioEconomics	Right-of-Way Acquisition	4.3-7	text reads, "However, since the pipeline would follow the transportation corridor from Amakdedori port to the mine site, it is not likely that a separate ROW arrangement would be needed."	A pipeline ROW lease is a separate authorization from a road easement. The pipeline ROW lease will have an annual rental cost separate from any road authorization costs. Recommend striking this sentence.
DNR/DOG/SPCS	Section 4.3 - SocioEconomics	4.3.6 Cumulative Impacts	4.3-11 to 4.3-12	inclusion of Alaska Stand Alone Pipeline, Drift River Oil Pipeline, and Alaska LNG	it is unclear why these projects are listed in this section. Text says, "The potential impacts for each major category are explained below" but no connection is clear in the text that follows the bulleted list. Elaborate on how these pipeline projects are pertinent to this discussion, or generalize more, as in Sec 4.12
DNR/DOG/SPCS	Figure 4.25-1			typo "Diamnod"	correct typo
DNR/DOG/SPCS	Figure 4.25-2			typo "Diamnod"	correct typo
DNR/DOG/SPCS	Section 4.12- Transportation	4.12.2.1 Natural Gas Pipeline Corridor	4.12-3	Text reads, "Heavy equipment traffic turning off the highway would exist, but would be less than the usual construction traffic experienced on Sterling Highway for road maintenance during the summer months (PLP 2018 RFI 037). Because construction of the pipeline would parallel the main transportation corridor, there would be limited disruption of community roads systems associated with pipeline installation."	This traffic may be less than construction traffic, but would be cumulative with road maintenance traffic, so the impact should not be disregarded.
DNR/DOG/SPCS	Section 4.12- Transportation	4.12.2.1 Natural Gas Pipeline Corridor	4.12-3	Text reads, "During operations and closure, the pipeline would have no effect on overland traffic."	Traffic during operations would be minimal but would exist for maintenance and inspection. Suggest changing "no effect" to "minimal effect"

DNR/DOG/SPCS	Section 4.11-Aesthetics	4.11.7 Cumulative Effects		list includes Donlin Gold, Alaska LNG, Drift River Oil Pipeline	It is unclear why these projects are listed in this section. Aesthetics from those pipelines seem unlikely to coincide with impacts from the Pebble project. Recommend including only those RFFA's pertinent to this component of the EIS section.
DNR/DOG/SPCS	various Section 4 "Cumulative Effects" lists, multiple locations			"Drift River Oil Pipeline"	The "Drift River Oil Pipeline Transportation Project" described on page 4.1-12 is permitted and active. Oil is now being transported via the repurposed Cook Inlet gas pipeline, and steps are being taken to decommission Drift River Terminal. As such, this project isn't RFFA as much as "in action". Suggest removing from RFFA lists.
DNR/DOG/SPCS	Section 4.9 Subsistence	4.9.6	4.9-14	list includes Donlin Gold, ASAP, Alaska LNG, Drift River Oil Pipeline	It is unclear why these projects are listed in this section. Text says, "The following RFFAs apply to the consideration of cumulative effects on subsistence resources and uses." but no connection is clear in the text that follows the bulleted list. Elaborate on how these pipeline projects are pertinent to this discussion.
DNR/DOG/SPCS	Section 4.13 Geology		4.13-14	pipeline is described with method for eastern Cook Inlet installation	add information about transition from sea to shore on western Cook Inlet, transitions at Iliamna Lake shores
DNR/DOG/SPCS	Section 4.7-Cultural Resources	4.7.7 Cumulative Effects	4.7-7 to 4.7-8	list includes Donlin Gold, Alaska LNG, Drift River Oil Pipeline	The impacts of these other projects on cultural resources is not apparently connected with Pebble impacts on cultural resources. If including, suggest a wrap-up similar to Section 4.13, which addresses the RFFA's near this proposed project.

DNR/DOG/SPCS	Section 4.24	4.24.2.4 Iliamna Lake Pipeline	4.24-12	text says, "HDD would be used to install the pipeline segments from the lakeshore into waters deep enough to avoid navigational hazards, then laid and secured on the lake bottom"	This is the only place I have seen a reference to HDD at the Iliamna Lake transitions. Other places, such as 4.18.2.4, say things like "HDD would be required only for the ... Kenai shore approach" Please clarify here or in other places whether HDD will be used at the lake transition.
DNR/DOG/SPCS	universal			lack of information about shore transitions for pipeline on west side of Cook Inlet, and at Iliamna Lake	please explain the methods of transition for these crossing areas; the lack of information makes it impossible to determine if effects have been adequately considered

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ADEC	Project Description (October 2018 Version)	4.1.2.1	55	Bullet 4 in this section discusses water management, but does not discuss how the dewatering volume is being determined and how it is addressed in the water management modules.	Please provide additional details on how dewatering volume is being determined and how that impacts water management modules.
ADEC	Project Description (October 2018 Version)	4.1.2.2	56	The title of this section is "Water Treatment", but the section only describes what waters are being treated.	Please provide details of how these waters will be treated or provide a citation to elsewhere in the document where this information can be found.
ADEC	Project Description (October 2018 Version)	4.1.3.1	57	Bullet five on this page discusses how an anticipated water surplus will not come to pass due water being consumed in tailings voids, evaporation and other minor uses. It is not clear how this conclusion was reached.	Please provide additional details on how this surplus will be consumed, so that we can understand the mathematical calculations that were made.
ADEC	Project Description (October 2018 Version)	6.2	73	The first paragraph in this section discusses post-closure water management but does not explain the plans for long-term water management and treatment.	Add information on the long-term water management and treatment as discussed in XXXXXX
ADEC	Project Description (October 2018 Version)	7	76	At the bottom of this page the 401 Certification of the Corp 404 permit needs to be added.	Please add the ADEC 401 Certification to the list of authorizations required for this project.
ADEC	Section 3.16 (Appendix K)	K3.16.1	K3.16-1	Bullet five on this page discusses groundwater is transmitted downgradient according to Darcy's Law. The non-technical reader may not understand what Darcy's Law means.	Please provide a footnote explaining Darcy's Law for the non-technical reader.
ADEC	Section 3.16 (Appendix K)	K3.16.1.1	K3.16-4	Paragraph two on this page discusses the difference between the standard adiabatic lapse rate of 3.6 F and the observed adiabatic lapse rate of 3.4 F. This may be confusing to the non-technical reader.	Please note that the difference is considered de minimis, so the observed temperature difference was used in the creation of a synthetic temperature dataset.
ADEC	Section 3.18 (Appendix K)	K3.18.1.1	K3.18-1	Paragraph two in this section discusses EPA water quality standards for mercury and selenium.	Updated input from Water Division: The EPA has issued aquatic life recommendations (in 2001 and 2016) that require adoption by states in a timely manner. ADEC is currently making revisions to their 2008 <i>Toxics Manual</i> for aquatic life and human health criteria. These actions are currently scheduled to be completed by the end of 2019. Any regulatory impact on the Pebble Project would depend on the timing of a permit application.

ADEC	Section 3.18 (Appendix K)	K3.18.2.1	K3.18-6	Paragraph two on this page discusses rock sample testing and included geochemical tests including ABA without explaining what ABA is.	The first two sentences from paragraph five could be inserted after the mention of ABA in the second paragraph and would provide a clearer explanation.
ADEC	Section 4.5		4.5-10	This section discusses reasonably foreseeable future actions possible in the region. The bullet list includes both the Alaska LNG project and the ASAP Pipeline project. It is not clear why both of these project are listed since only one could ultimately be built.	Please provide additional details explaining this to the non-technical reader or limit the listing to the Alaska LNG projects as shown on page 4.11-11
ADEC	Section 4.10 (Appendix K)	K4.10.2.1	K4.10-8	It is not clear why the Pebble project's drug and alcohol workplace policy is being discussed here. Prior discussions have focused on health impacts "outside the fence", but this one appears to address issues inside the fence.	Please explain.
ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-18	Bullet three on this notes that <i>"The far-field impact assessment concluded that AQRVs would not likely be affected at any of the PSD Class 1 or federal PSD Class II areas."</i> It is not clear why federal Class II areas were included in this sentence since regulatory protections for Air Quality Related Values (AQRVs) only exist for Class I areas, such as national parks.	Please explain.
ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-20	Paragraph one on this pages notes that <i>"With implementation of the mitigation measures for idling and dust suppression, dust/PM would not be expected to exceed the annual PM thresholds and further reduce the ratio of estimated near-field concentrations for all project components to below AAQS."</i> Without a specific citation to the mitigation measure for idling and dust suppression, how are we to know whether they will be able to reduce the dust/PM?	Please list the mitigation measures or cite to where they can be found.

ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-20	<p>Bullet one on this page notes that <i>"PLP expects a 35-foot wide buffer zone on either side of the transportation corridor to be impacted by snow plow spray, gravel spray and road dust."</i> It is not clear where this 35-foot buffer was arrived at. A number of recent EISs on the North Slope have noted that <i>"the passage of vehicle traffic over gravel pads, roads and airstrip would result in a gravel spray, dust shadow with measureable impacts on soil, vegetation and permafrost extending out to 300 feet from the edge of the gravel feature."</i> The discussion of fugitive dust impact on wetlands on page 4.22-19 notes that a potential indirect impacts area was calculated using a 330-foot buffer on all permanent road footprints.</p>	Please explain why a 35-foot buffer is being used.
ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-20	<p>Bullet two on this page notes that <i>"PLP would follow an idling policy, such as not allowing haul trucks to idle for more than a set amount of time if the vehicle or equipment is not in motion, which would reduce fuel consumption and reduce vehicle exhaust emissions, including PM."</i> It is not clear how non-enforceable BMPs can be used as mitigation measures so that dust /PM would not exceed the annual PM thresholds.</p>	Please explain.
ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-20	<p>Bullet three on this page notes that <i>"A fugitive dust control plan (FDCP) would be developed by PLP for mitigation and control of project activity related fugitive dust and wind erosion."</i> Since this fugitive dust control plan has not been written and there is no discussion of which agency would be responsible for compliance and enforcement, it is not clear how this can be used as a mitigation measure so that dust /PM would not exceed the annual PM thresholds.</p>	Please explain.

ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-21	Paragraph two on this page notes that " <i>With effective dust mitigation measures, the potential air exposure pathways for the project would be insignificant.</i> " It is not clear how this conclusion was reached. The department's experience with the Red Dog Mine was that extensive measure have been required to limit the impacts of fugitive dust on the surrounding vegetation and subsistence resources.	Please explain.
ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-21	Paragraph six on this page notes that " <i>three metals (arsenic, chromium, and copper) have baseline concentrations above the selected human health comparative action levels (CALs)....</i> " but would result in " <i>negligible increased cancer risk or hazard... .</i> " It is not clear how this conclusion was reached without providing the reader with the baseline concentrations and the selected human health comparative action levels. Time frame is also relevant to the discussion, as it is not clear from the text if the model prediction is based off end of life or a yearly increase. Please also note that DEC has released a technical memorandum regarding evaluating metals at contaminated sites in August of this year that may inform this discussion. This guidance can be found at https://dec.alaska.gov/spar/csp/guidance-forms/ and then enter " <i>metals</i> " in the search box	Please provide the baseline metals concentrations outside the fence area and the predicted increase in concentrations expected. The percent increase provided from a model is dependent on the starting value. Please provide the time frame used in the model calculations. It also should be noted in this discussion that the default particulate emission factor that is incorporated in the ADEC soil method 2 inhalation pathway does not capture the increase in dust generation or incorporate any subsistence pathway. This discussion also need to answer two questions. (1) Will mining activities cause arsenic to migrate? and (2) Will mining activities concentrate arsenic?
ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-21	Paragraph three on this page appears to conclude that post-closure monitoring will indicate that water quality meets the approved criteria for discharge without treatment at approximately 50 years post closure. It is not clear how this conclusion can be reached without a detailed discussion of water treatment.	Please provide additional details.

ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-25	<p>Paragraph one on this page notes that "<i>Without vegetated cover and food resources, birds are not likely to be attracted to the TSF. The open pit lake would be deep, contain no shallow water habitats, and lack freshwater vegetation, but some waterfowl may use it during open water months. Based on this, migratory waterfowl would not be expected to have substantive exposure to the mine site water storage features.</i>" It is not clear how this conclusion was reached when there have been repeated incidents of waterfowl deaths at the Berkeley Pit, a former open pit copper mine in Butte, Montana</p>	Please provide additional details that would substantiate the document's conclusion.
ADEC	Section 4.10 (Appendix K)	K4.10.2.3	K4.10-32	<p>Paragraph four on this page cites to 18 AAA 31. This citation is incorrect as the Alaska Administrative Code is abbreviated at <u>AAC</u></p>	Please correct this citation.
ADEC	Section 4.10 (Appendix K)	Figure K4.10-1		<p>Footnote five on this figure notes that "<i>Mine site dust deposition modeling and estimated media impacts indicate that increases would be negligible, with increases of <3.2% for antimony and <1% for all other metals.</i>" It is not clear how this conclusion was reached. The department's experience with the Red Dog Mine was that extensive measures have been required to limit the impacts of fugitive dust on the surrounding vegetation and subsistence resources.</p>	Please explain.

ADEC	Section 4.10 (Appendix K)	Figure K4.10-2		Footnote six on this figure notes that <i>"Since air emissions would be expected to meet permit requirements and/or air quality standards and dust deposition would not be expected to increase metals concentrations above baseline, impacts to wild foods above baseline would not be expected (ie. insignificant)."</i> It is not clear how this conclusion was reached. The department's experience with the Red Dog Mine was that extensive measures have been required to limit the impacts of fugitive dust on the surrounding vegetation and subsistence resources.	Please explain.
ADEC	Section 4.18 (Appendix K)	K4.18.1.1	K4.18-6	Paragraph two on this page notes that <i>"Treated water in excess of process requirements would be released to the environment in the North Fork Koktuli and South Fork Koktuli rivers and the Upper Talarik Creek watersheds at flow protective of the environment to the extent possible given the capabilities of the WTPs and the need for process water use onsite."</i> It is not clear what is being said here as we are being given assurances, but those assurances have a caveat that they will happen "to the extent possible" given the capabilities of the WTPs.	If water volume modeling exists for this treated water discharge, please provide estimates and comparisons to the capabilities of the WTPs so that the reader can understand whether the WTPs are being designed to meet minimum standards or whether they are being designed to cover a greater percentage of eventualities in terms of water discharges.
ADEC	Section 4.18 (Appendix K)	K4.18.1.2	K4.18-11	Paragraph one on this page note that <i>"The average annual surplus from the open pit is about 3cfs."</i> It is not clear how this can be considered a annual surplus measurement since water flow is measured in units of volume per unit of time. Flow can be measured at cubic feet per second (cfs), gallons per minute (gpm), acre feet per day or other measurement units.	If the document is going to express the water flow surplus on an annual basis, please convert the number to one that make sense in terms of the unit of time.

ADEC	Section 4.18 (Appendix K)	General		Many discussions in this section mention that solids or rejects from certain operations would be transferred to the TSF or the pyritic TSF. It is not clear from these discussions whether the TSF will be reclaimed after closure and how these discharges would impact the reclamation efforts.	Please provide details or a citation to discussions elsewhere in the document.
ADEC	Section 4.18 (Appendix K)	K4.18.2.4	K4.18-27	The final paragraph on this page notes that " <i>However, based on the independent review conducted of the water treatment approach (AECOM 2018i), there is some concern that waste products high in selenium and salt placed in the pyritic TSF may, over time, lead to increased TDS concentrations in the main WMP.</i> " It is not clear how waste products in the pyritic TSF would lead to increase TDS concentrations.	Please provide details or a citation to discussions elsewhere in the document.
ADEC	Section 4.18	4.18.2.1	4.18-6	The first paragraph on this page discusses details of ADEC regulation of wastewater from hard-rock mining through various permits. It is not clear from this general discussion whether all point source discharge locations have been described. It will be important for the draft EIS to evaluate the potential impacts from those discharges over appropriate spatial and temporal scales. Please provide details on all point source discharge locations or cite to where the information can be found.	Please also add the following text regarding the department's regulatory authority: The DEC administers the Alaska Pollutant Discharge Elimination System (APDES) Program, in compliance with the Clean Water Act (CWA), 33 U.S.C §1251 et seq., as amended by the Water Quality Act of 1987, P.L. 100-4, Alaska Statute (AS) 46.03, and the Alaska Administrative Code (AAC), as amended, and other applicable state laws and regulation, to authorize and set conditions on discharges of pollutants from facility to waters of the United States. To ensure protection of water quality and human health, APDES permits place limits on the types and amounts of pollutants that can be discharged from a facility and outlines best management practices to which a facility must adhere
ADEC	Section 4.22	4.22.4.2	4.22-25	Paragraph two on this page discusses the impact of fugitive dust on wetlands. It notes that " <i>The greatest effect on wetlands functions are expected to occur within 33 feet of the roads.</i> " It is not clear why a 35-foot buffer is used in Section 4.10 and a 33-foot buffer is used in Section 4.22.	Please explain.

ADEC	Section 5.2	5.2.1.2	5-5	<p>Bullet one on this page notes that <i>"Use of BMPs, such as revegetation planning, watering and use of dust suppressants to control fugitive dust."</i> It is not clear how this matches up with the CEQ language that the EIS should indicate the likelihood that such measures will be adopted or enforced by the responsible agencies. Nowhere in this document has there been any discussion of what agency would be responsible for compliance and enforcement of the fugitive dust control plans.</p>	Please explain.
ADEC	Section 5.2	Table 5-2	5-7	<p>The second listing on this table discusses a Fugitive Dust Control Plan. It is not clear from this discussion of what agency would be responsible for compliance and enforcement of the fugitive dust control plans.</p>	Please explain.
ADEC	Section 5.2	Table 5-2	5-9	<p>The second listing on this table notes that <i>"The project would use BACT for all air emissions sources."</i> It is not clear if this statement is true for <u>all</u> air emissions sources. The 1977 Clean Air Act amendments pertaining to the Prevention of Significant Deterioration (PSD) require that the determination of best available control technology (BACT) be performed on a case-by-case basis considering energy, environmental, and economic impacts and other costs. It should be noted that BACT requirements are an achievable emissions limitation determined by the <u>permitting authority</u> on a case-by-case basis.</p>	<p>It is premature in the DEIS phase to be discussing BACT, The State of Alaska has authority over BACT, which is not implemented until the permitting phase when the State has the opportunity to determine what is BACT for a certain emission unit. There is also nothing to stop the Pebble Project from volunteering to put BACT controls on all of their emission units even if it's not required. If they volunteer to put BACT on it doesn't mean that ADEC could necessarily require BACT in the permit. Please clarify if they are volunteering to put BACT controls on for given pollutants even if its not required. If Pebble has made emission estimates and they know that all the pollutants will trigger a BACT analysis that should be discussed.</p>

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ADHSS/DPH/SOE	Chapter 3: Affected Environment	Section 3.10-1	3.10-2	Edit needed: Health data are not always available at the community level for these potentially affected communities, due to privacy concerns and very small community sizes, and are not considered to be severe limitations for the purposes of the project.	Suggested edit: Health data are not always available at the community level for these potentially affected communities, due to privacy concerns and very small community sizes. To address these limitations, regional data sources within and near the EIS analysis area, including the Lake and Peninsula Borough, Bristol Bay Borough, Dillingham Census Area, Kenai Peninsula Borough, and city of Anchorage, were included in the evaluation
ADHSS/DPH/SOE	Chapter 3: Affected Environment	Table 3.10-1	3.10-3	Inclusion of population size with age ranges is important, as children are more susceptible to many types of environmental fluctuations. Also, due to the importance of the subsistence lifestyle in these communities, the relevance of the proposed project to the quality and abundance of fishery resources, and the relationship between the shift toward a western diet and rates of chronic diseases of poor nutrition, it would be useful to include community level data on the number of residents that rely on subsistence practices in the table	Include a column for population size and % subsistence users for each community in the table
ADHSS/DPH/SOE	Chapter 3: Affected Environment	Table 3.10-1	3.10-3	The indicators on this table have implications for human health. This should be discussed in section 3.10.4.1	Include a discussion of SES factors (presented in this table) in 3.10.4.1
ADHSS/DPH/SOE	Chapter 3: Affected Environment	Table 3.10-1	3.10-4	Data sources should not be presented as a bulk footnote. In-text citations that enable the reader to locate sources and full datasets relatively easily, and to make choices about quality of data, etc. are needed.	Include full, in-text citations for each piece of data. At minimum, include a separate footnote for each source at the end of the table.
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.1	3.10-5	Though discussed in Section 3.3, SES indicators have implications for human health. Key findings should be discussed in this section.	Include a discussion of key SES factors in this section
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.1	3.10-5	Clarification needed on: "While the Kenai Peninsula region typically has SDH similar to Anchorage, the Bristol Bay region tends to have higher rates of inadequate prenatal care and teen pregnancy, but higher rates of adult dental care and lower rates of adult tooth loss, poor mental health, and adult binge drinking "	Clarify which regions are being compared in the last part of this sentence
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.1	3.10-5	More information needed: "While the Kenai Peninsula region typically has SDH similar to Anchorage, the Bristol Bay region tends to have higher rates of inadequate prenatal care and teen pregnancy, but higher rates of adult dental care and lower rates of adult tooth loss, poor mental health, and adult binge drinking "	Add discrepancy of suicide mortality
ADHSS/DPH/SOE	Chapter 3: Affected Environment	Table 3.10-2	3.10-6	Data sources should not be presented as a bulk footnote. Correct citations needed for each piece of data so that the reader can find the full information, make choices about quality of data, etc.	Include full citations for each piece of data. At minimum, include a separate footnote for each source at the end of the table.
ADHSS/DPH/SOE	Chapter 3: Affected Environment	Table 3.10-2	3.10-6	Many indicators have more recent data available, which would be useful to update, and data for many of the blank cells are available	Add most recent available information, especially where cells are blank
ADHSS/DPH/SOE	Chapter 3: Affected Environment	Table 3.10-2	3.10-6	Clarify which communities are included in the 3rd and 4th columns	Add clarification as a footnote
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.1	3.10-8	To provide better context, the first paragraph on page (last paragraph of section) should be moved before specific details of regions/communities are discussed.	Move paragraph to earlier in section
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.2	3.10-8	Discuss if unintentional injuries are a leading cause of mortality in the PAC regions	Add leading cause of death info for PAC regions
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.2	3.10-8	More current information needed in second paragraph of section. Data presented are over 13 years old	Update data

ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.2	3.10-8	Citations needed for data sources	Add citations for original source of regional hospitalization discharges, leading causes of non-fatal injuries requiring hospitalization, and baseline accident and injury rates
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.2	3.10-8	Additional context needed for "The role of alcohol in accidents and injuries is well-known, and various Alaska Native villages have enacted policies that designate a community as dry (i.e., no sale or consumption of alcohol), damp (i.e., no sale, but possession allowed), and wet (i.e., sale, importation, and possession allowed)."	Add contextual details, such as which PACs are dry/damp/wet
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.2	3.10-8	For the last paragraph, "table 3.10-3 presents the baseline accident and injury rates for the affected communities..": While this data are presented in a table, some type of summary discussion is needed to contextualize this information for the PACs in order to help highlight existing issues that could be worsened by the project and identify opportunities to improve an adverse outcome and maintain strengths	Add summary discussion of data presented in table 3.10-3
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.2	Table 3.10-3	Citations needed for data sources	Add citations for original source of regional hospitalization discharges, leading causes of non-fatal injuries requiring hospitalization, and baseline accident and injury rates
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.2	Table 3.10-3	The last three rows are of minimal utility, since data points are presented at statewide level only	Remove last three rows or add regional information (which is available from sources such as the Alaska Trauma Registry)
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.3	3.10-12	Additional information is needed for sentence "baseline surface water...occasionally exceeded their maximum criteria". Summarize which trace elements/metals had exceedances and where this was in relation to key PACs	Add additional information
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.3	3.10-12	Additional information is needed for discussion of contaminated sites. Are there sites in close proximity to PAC residents? The project footprint?	Add additional information
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.3	3.10-13	A summary discussion is needed to contextualize the information in section 3.10.4.3 for the PACs in order to help highlight existing issues that could be worsened by the project and identify opportunities to improve an adverse outcome and maintain strengths	Add summary discussion of data presented in section 3.10.4.3
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	Entire section could be better organized for readability (i.e., a separate paragraph for food cost, physical activity, subsistence). It is also unclear what the intended meaning of "enough physical activity" is.	Reorganize section
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	This section refers the reader to the paragraph addressing HEC7, which also does not cover nutrition related disease rates in sufficient detail. The relationship between the loss of subsistence practices due to concerns (whether real or perceived) about contamination and adverse health effects has been established. It is important to consider the potential for this to occur in these communities, and include a discussion of the implications.	Recommend discussing how concerns about contamination (whether real or perceived) from regional extractive industry development can lead to a shift away from subsistence practices, and the implications for health in these communities.

ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	Geologic materials that are enriched in metals (like gold and copper) will also contain higher concentrations of volatile heavy metals (e.g. mercury, and to a lesser extent, cadmium) than standard background materials, which were used in the model. Weathering of ore, and on site ore processing may result in substantial atmospheric deposition of heavy metals, particularly Hg, into nearby bodies of water. Some of these metals exert additive toxicity, and run off/discharge/deposition of other non-metal mining byproducts can increase heavy metal bioavailability (e.g. Hg methylation rates increase in response to increased sulfate and organic carbon). Although referenced as being addressed in section 3.24, the potential impacts of increased mobilization of heavy metals into the food web on subsistence fisheries should be mentioned in sections concerning human health.	Consider including a discussion of the potential for increased atmospheric deposition of heavy metals (from volatilization, dust, and leaching combined) and mobilization into aquatic food webs (in the context of subsistence activities) from mining activities, and potential effects on human health. This should include effects of increased heavy metal exposure through fish consumption, and maternal transfer of dietary metals (particularly MeHg).
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	Though discussed in Sections 3.3 and 3.9, data from these sections have implications for human health. Key findings should be discussed in this section.	Include a discussion of key subsistence, food cost, and food security factors in this section
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	Include citations for original sources of data referenced throughout entire section	Add citations for original sources of data
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	Include year/time periods for original sources of data referenced throughout entire section	Add years/time periods for original sources of data
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	For mentions of 'these communities' throughout section, clarify which communities are included, otherwise just refer to regions	Add clarification
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	For mentions of "these communities report.." change report to self-report (if that is true)	Add clarification of how communities reported info (i.e., self-report?)
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	Discussion and data on food security are needed	Add information on food security in the region/PACs
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.4	3.10-13	A discussion of the contribution of subsistence resources to daily food intake is needed. Data from section 3.9 Subsistence should be summarized (for example, percent of households harvesting XX amount of salmon, top harvested resources in the PACs	Add additional information
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.5	3.10-14	Leading cause of death in PAC needed	Add how infectious disease deaths rated in leading causes of death in PACs, or add that data were not available (if that's the case)
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.5	3.10-14	For "noteworthy are the conditions that promise the spread of infectious disease, such as unsafe water, poor personal hygiene, and unsanitary conditions" additional context is needed, otherwise it seems to imply that PACs are unsanitary.	Rewrite sentence: expand on the point and add data
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.5	3.10-14	Edit sentence: Immunizations play an important role in decreasing the rates of infectious diseases.	Suggested edit: Immunizations play an important role in decreasing the rates of some infectious diseases.
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.5	Table 3.10-4	Data sources should not be presented as a bulk footnote. Correct citations needed for each piece of data so that the reader can find the full information, make choices about quality of data, etc.	Include full citations for each piece of data. At minimum, include a separate footnote for each source at the end of the table.
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.5	Table 3.10-4	Row of laboratory confirmed influenza is of limited utility, given that only counts are available. Suggest removing this row	Remove this row or add rate information (if available)

ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.5	3.10-14	A summary discussion is needed to contextualize the information in section 3.10.4.5 for the PACs in order to help highlight existing issues that could be worsened by the project and identify opportunities to improve an adverse outcome and maintain strengths	Add summary discussion of data presented in section 3.10.4.5
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.6	3.10-15	Mentions of invasive pneumococcal disease and unserved Alaska communities should be tied to PACs or these sentences should be removed to avoid confusion. It is also unclear whether the paragraph is including the statistics on Southwest Alaska because it encompasses some of the PACs, or if the YK is mentioned to discount this statistic (in which case, remove this part of the sentence)	Clarify what points are being made in the first paragraph of this section
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.6	3.10-15	Suggest also including water/sewer service data from the US census	Add additional water/sewer information
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	3.10-15	For "The three recent leading causes of death due to non-communicable and chronic diseases were cancer, heart disease, and chronic obstructive pulmonary disease..", clarify which PACs/regions are being discussed	Add clarification
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	3.10-15	Discussion of leading causes of death may be better achieved with the addition of a table. As is, it is confusing to read	Add table with leading causes of death in Lake and Peninsula Borough and Dillingham Census area
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	3.10-15	Discussion of leading causes of death may be better achieved with the addition of a table. As is, some important pieces of information are likely missing, such as reliability of the data (small numbers) and years/time period of data	Add table with leading causes of death in Lake and Peninsula Borough and Dillingham Census area and appropriate footnotes
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	3.10-15	Discussion of leading causes of death may be better achieved with the addition of a table. As is, some important pieces of information are likely missing, such as how data compare to other regions/the state/etc.	Add table with leading causes of death and include tables for regions of comparison to better contextualize the information
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	3.10-15	Discussion of cancer mortality may be better achieved with the addition of a table. As is, it is confusing to read	Add table for cancer mortality in Lake and Peninsula Borough and Dillingham Census area
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	3.10-15	Discussion of cancer incidence may be better achieved with the addition of a table. As is, some important pieces of information are likely missing, such as reliability of the data (small numbers) and years/time period of data	Add table for cancer incidence in Lake and Peninsula Borough and Dillingham Census area and appropriate footnotes
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	3.10-15	Discussion of cancer incidence may be better achieved with the addition of a table. As is, some important pieces of information are likely missing, such as how data compare to other regions/the state/etc.	Add table for cancer incidence and include tables for regions of comparison to better contextualize the information
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	Table 3.10-5	Data sources should not be presented as a bulk footnote. Correct citations needed for each piece of data so that the reader can find the full information, make choices about quality of data, etc.	Include full citations for each piece of data. At minimum, include a separate footnote for each source at the end of the table.
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.7	Table 3.10-5	While there is a lot of data presented in Table 3.10-5, some type of summary discussion is needed to contextualize this information for the PACs in order to help highlight existing issues that could be worsened by the project and identify opportunities to improve an adverse outcome and maintain strengths	Add summary discussion of data presented in table 3.10-5

ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.8	3.10-19	Update data for: "The top three leading hospital discharges in the Lake and Peninsula Borough, Bristol Bay Borough, and Dillingham Census Area by diagnosis (2001 to 2005) were..." These data are over 13 years old and a comparison to the next sentence with 2015 data should not be made.	Update data
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.8	Figure 3.10-1	The figure does not add much value to this section, consider removing	Remove figure unless it can be tied to PAC data
ADHSS/DPH/SOE	Chapter 3: Affected Environment	3.10.4.8	Figure 3.10-1	This figure appears to be repeated due to a formatting error	Fix formatting issue
ADHSS/DPH/SOE	Chapter 3: Affected Environment	Table 3.10-5	3.10-16	There exists some potential for anthropogenic heavy metal release in any operation that exposes metal-containing ores to weathering processes (particularly mercury, due to its high volatility). Because many metals are known to be neurotoxic, it would be good to include baseline data on the prevalence of neurodegenerative disorders (e.g. Parkinson's Disease, Alzheimer's Disease) among adults, and neurobehavioral/cognitive disorders in children for these populations.	Add current incidence of neurodegenerative disorders for adults and neurobehavioral disorders in children in these communities to table.
ADHSS/DPH/SOE	Appendix K4.10	K4.10	K4.10-3	Needs edits: For example, Lake and Peninsula Borough (LPB) community-level baseline data (≤ 2016) are available for leading hospitalizations by diagnosis, leading causes of non-fatal injuries, and leading causes of death (see Section 3.10, Health and Safety, HECs 2 and 7), while similar community-level data are not available for the Nushagak/Bristol Bay communities.	Suggested edit: For example, Lake and Peninsula Borough (LPB) regional -level baseline data (from 2016-2017) are available for leading hospitalizations by diagnosis, leading causes of non-fatal injuries, and leading causes of death (see Section 3.10, Health and Safety, HECs 2 and 7), while similar regional -level data are not available for the Nushagak/Bristol Bay communities (edited because community-level data was not presented)
ADHSS/DPH/SOE	Appendix K4.10	K4.10	K4.10-3	"For example, Lake and Peninsula Borough (LPB) community-level baseline data (≤ 2016) are available...while similar community-level data are not available for the Nushagak/Bristol Bay communities." These data are available, just not with the report used for this draft section. Also, some of the data is actually presented in HECs 2 and 7, so this sentence needs some revision	Revise sentence
ADHSS/DPH/SOE	Appendix K4.10	K4.10	K4.10-4	Rephrase for clarity, and add number of jobs to provide context: "PLP exploration-related employment and income—which were realized in the Bristol Bay region over the previous decade—would cease. Human health impacts associated with the loss of jobs and decrease in household income for communities closest to the mine site (Nondalton, Iliamna, and Newhalen) would be expected to be minor in magnitude, with changes relative to baseline; with potential increases or decreases in SDH, such as income, psychosocial stress, substance abuse, and family stability."	Add job detail information. Suggest revising passage to read: "Human health impacts associated with the loss of employment opportunities (and subsequent decrease in median household income) primarily concern potential impacts on SDH (e.g., income, psychosocial stress, substance abuse, and family stability). Any expected changes in SDH would be relatively minor in magnitude, relative to baseline, and would largely be confined to the communities closest to the mine site (Nondalton, Iliamna, and Newhalen).

ADHSS/DPH/SOE	Appendix K4.10	K4.10	K4.10-5	"The HIA does not evaluate human health impacts from potential spills or failures. The potential health impacts from exposure to chemicals due to a spill or failure are unanticipated and are typically short-term, acute exposures." While the HIA model used in this appendix may not be designed to discuss all possible spill/failure possibilities, it is reasonable to include a discussion of such potential impacts in the Health and Safety sections of an EIS. For example, findings from Section 4.27 Spill Risk should be integrated into Health and Safety Sections, where relevant. Furthermore, while direct human exposure may be short-term or acute following a spill, there are other routes of exposure (e.g., consumption of contaminated foods and/or water, maternal transfer through breastmilk) that can persist long after an initial spill event. This can create chronic exposure scenarios for humans that have long-term health implications.	Recommend discussing the potential impacts of spills/failures in the Health and Safety sections of the EIS, including the potential for indirect routes of exposure to create chronic exposure scenarios. Findings from Section 4.27 Spill Risk should be integrated into Health and Safety Sections, where relevant.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	Table K4.10-3	This table should go after the narrative, which would be consistent with summary tables for the other HECs	Move table to after narrative for HEC
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	Table K4.10-3	Increase in household incomes row: check math. There's an addition error in the third part of this row	Correct severity and impacts rankings by ensuring all ratings have been added correctly.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	Table K4.10-3	Magnitude for the first potential impact (increased in household incomes..) is better represented as a 1 for closure, since jobs will significantly decrease and households will have to adjust to this change	Revise rows related to this potential impact
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	Table K4.10-3	Geographic extent for the first potential impact (increased in household incomes..) is better represented as a 1 for closure, since jobs will significantly decrease and households will have to adjust to this change	Revise rows related to this potential impact
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	Table K4.10-3	Potential impacts due to psychosocial stress: the likelihood during construction and operations is better represented as 33-66% as this impact (pos and neg) is already being reported in households	Revise likelihood ranking for operations and construction and edit impact rating accordingly
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	K4.10-7	For "The project would result in 2,000 jobs during the construction phase, and 850 jobs during the operations phase, and some jobs would continue during closure", add number of jobs expected for PACs (i.e., likely about 50% of local hire for construction).	Add additional job # estimates
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	K4.10-7	For "The project would result in 2,000 jobs during the construction phase, and 850 jobs during the operations phase, and some jobs would continue during closure", add number of jobs expected for closure and some information of potential % of local workers. Data from another Alaska mine as an example may help add context	Add additional information
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	K4.10-7	For the bullet discussing the benefits of employment opportunities: addition of examples from other similar-scale projects may be useful	Add additional information

ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	K4.10-7	"The summary impact to human health due to increased household incomes, employment rates, and education attainment for the potentially affected communities would be Category 3": Potential impacts during closure are better represented as Category 2. See comments on table K4.10-3	Revise category ranking for closure
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	K4.10-7	Comments on household incomes/employment/educational attainment could be supported with examples, such as with data from Red Dog	Consider adding additional detail
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	K4.10-9	"The summary impact to human health due to changes in psychosocial stress for the potentially affected communities is rates as Category 2": Potential impacts during construction and operations are better represented as Category 3. See comments on table K4.10-3	Revise category ranking for operations and construction
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	K4.10-9	"However, the likelihood of this impact occurring is considered unlikely for all phases, because it is a multi-dimensional aspect that is influenced by many factors, and the probability of a significant contribution from any one factor would be low." Impacts to psychosocial stress (positive and negative) are already occurring for some individuals, so the likelihood should be higher. See comments on table K4.10-3	Revise likelihood rating and edit sentence to reflect changes
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.1	K4.10-9	"Transportation-related unintentional accidents and injuries account for approximately 44 percent of hospitalizations in the state (Section 3.10, Health and Safety)": Provide some information for each region potentially impacted by each feature of the project (pipeline, mine, etc.), whether that is quantitative or qualitative (if data are largely unavailable)	Provide additional region-specific information
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.2	K4.10-10	"The project would work with communities (and supply funding) to provide for the marking and maintenance of snow machine trails between communities across Iliamna Lake, when lake ice is thick enough to support such traffic.": Clarify if this is a commitment from the company, a mitigation, etc. If not, consider adding this at a mitigation	Clarify commitment from company or mitigation measure. Add as a mitigation
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.2	K4.10-10	Several sentences in HEC4 (food, nutrition, subsistence) imply that roads, ferries, etc. may be used by the public. This public use possibility, especially when paired with heavy use by workers, could increase accidents/injuries in all parts of the transportation corridor and this should be addressed in K4.10.2.2 (and rated appropriately)	Add clarifications and additional information relating to the interactions of public/workers on features of the project transportation corridor and the potential impacts to accidents and injuries. Make related edits to Table 4.10-4
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.2	K4.10-10	"The likelihood of these accidents occurring range from .to very unlikely for surface transportation..." Surface transportation would be better represented as unlikely (10-33%). Impact rating remains the same.	Revise likelihood rating for surface transportation and edit sentence to reflect changes

ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.2	K4.10-10	"...unintentional injuries from falls accounts for 44 percent of hospitalizations in the state..". Regional data are available from sources such as the Alaska Trauma Registry and would be useful to reference to show existing burden (or lack of it) and better inform the rating of this impact	Add/reference additional information
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.2	K4.10-10	"...suicide rates vary by regions..". Mention of regional data and disparities would be useful to reference to show existing burden (or lack of it) and better inform the rating of this impact	Add/reference additional information
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.3	K4.10-16	When presenting potential COPC impacts to water quality, it would be useful to add whether monitoring is occurring/will occur at the mine site	Add mention of water monitoring plans when discussing potential COPC impacts to water quality, even if the mention is just as in parentheses
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.3	K4.10-19	"In addition, given that these estimates of PM...was further qualitatively evaluated below": This sentence is at the bottom of the page and is followed by Table K4.10-6, which is not the 'further qualitative evaluation'. Revise sentence to be less confusing.	Revise sentence or move table K2.10-6
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.3	K4.10-21	Summary of Air Exposure Pathways: Recommend identifying all source contributions, including atmospheric deposition of highly volatile metals (only dust deposition is mentioned). Because of the bioaccumulative nature of many metals and biomagnification in the food web, it is important to include all routes considered when discussing potential risks to human health.	Recommend including atmospheric deposition of volatile metals as an airborne exposure pathway to subsistence foods, and discussing the potential risk to human health.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.3	K4.10-22	Mine Site Discharges to Surface Waterbodies: The exposure pathways do not mention atmospheric deposition of volatile metals into nearby bodies of water (only dust deposition). Due to the direct and rapid effects on on the food web, it is most useful to report the operational impact on the total Hg loading budget from all sources (including dust, treatment discharge, runoff and volatilization) rather than as a percent increase of sediment and water individually. Recommend also discussing the potential for effluent/runoff/deposition of non-metal contaminants (e.g., sulfates, organic carbon, etc.) to increase the bioavailability of existing metals, including increased rates of mercury methylation and implications for fish tissue concentrations. Increases in sulfates and DOC have been shown to correspond with higher tissue burdens in fish, even in the absence of additional Hg deposition.	Recommend reporting the operational impact on total Hg loading budget from all sources (including dust, treatment discharge, runoff and volatilization), and including the impact of other mining discharges on the bioavailability of metals in aquatic ecosystems. Recommend including implications for subsistence foods.

ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.3	K4.10-23	<p>Mine Site Dust Deposition to Surface Waterbodies: Recommend discussing the uncertainty surrounding the projected 0.11-0.66% of metals in sediment, and 0.1-0.7% increase in surface waters from dust deposition, how the total loading budget of important metals will be affected by these increases, and what these changes predict for fish tissue concentrations. Recommend identifying all the source contributions (dust deposition is consistently mentioned throughout the health sections, but atmospheric deposition of volatile metals is not). Also recommend identifying which metals these estimates include (as of now it only mentions antimony, copper, arsenic and chromium), and the sediment depth this estimate refers to. The sediment quality chapter indicates that the predicted % change in soil values concern elemental mercury concentrations in the top 1-inch, leaving the reader to assume that this depth also applies to sediment. If this is not the case, recommend clarifying. The increase in Hg at the sediment-water interface (~top 1/2-cm) is the value of most importance for bioaccumulation/biomagnification in</p>	Recommend expanding discussion and modifying the form of mercury given in the projected increases to MeHg. Discuss in terms of food safety for subsistence consumers, particularly sensitive populations.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.3	K4.10-24	<p>Last sentence before the subsistence foods exposure pathways, "Therefore, the incremental arsenic risk/hazard...": This sentence should be about cobalt/manganese, as arsenic was addressed previously</p>	Edit sentence to cobalt/manganese instead of arsenic
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.3	K4.10-24	<p>Subsistence Foods Exposure Pathways: Recommend listing the contaminants of concern for subsistence foods in this paragraph, rather than grouping them as "metals." Maternal transfer should also be discussed as an exposure route for sensitive populations, and maternally transferred metals should be identified. In its present form, it does not appear that atmospheric deposition of volatilized Hg is considered as an exposure pathway for subsistence users (it only seems to include contributions from deposited dust and direct exposure to mining ponds). Here and throughout, please clarify this point.</p>	Please add requested information to the Subsistence Foods Exposure Pathways paragraph.

ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.3	K4.10-24	<p>Mine Site Dust Deposition to Wild Foods: Suggest revising the statement "ADEC considers several of these metals to be potentially bioaccumulative" to better communicate the scientific consensus on the bioaccumulative nature of many of these metals. Please specify which abiotic media are expected to increase by how much, as increases in metal concentrations in water, the sediment-water interface, and buried sediments do not affect food web responses to the same magnitude. Biomagnification should be discussed here in addition to bioaccumulation, particularly in the context of relating/translating incremental increases in the metal content of water and sediment to anticipated increases in the tissues of subsistence foods after biomagnification. Projected tissue increases in biota should be based on the operational impact on the total loading budget from all sources for relevant metals.</p>	Recommend revising wording here and throughout, to better communicate the scientific consensus on metal bioaccumulation. A discussion of biomagnification/trophic transfer, and relate projected increases in metal concentrations of water and sediment to changes in the tissue concentrations of subsistence foods would also be useful.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	K4.10-28	<p>Because of the important implications for the quality of subsistence foods for human consumption, recommend adding justification for the statement that "heavy metal concentrations in subsistence foods will be indistinguishable from baseline levels," (include references). A discussion of how the projected increase in metal concentrations in water and sediment will affect the likelihood that subsistence consumers will exceed reference doses (RfD) for relevant metals would be useful, accounting for nearly daily consumption of fish for many residents (and the uncertainty surrounding estimates). This is a particularly important case to make for sensitive populations. Many of these metals are maternally-transferred developmental neurotoxins, which affect the developing nervous system at very low exposure concentrations.</p>	Recommend adding justification to show that this increase will not result in chronic dietary exposures to any of these metals (i.e. values will not exceed RfDs); accounting for the high fish consumption rate, uncertainty, and the sensitivity of the developing nervous system. Recommend adding references for the aforementioned topics.
ADHSS/DPH/SOE	Appendix K4.10	Figure K4.10-1	Figure K4.10-1	<p>Health impacts for subsistence users are classified as insignificant.</p>	This figure may need to be revised if the concerns above cannot be sufficiently addressed, particularly for sensitive populations.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	K4.10-28	<p>Food security should be discussed in this HEC. Positive and negative effects are possible. Also, as mentioned in a previous comment, cost of living does not equal food security. There are other components to food security and these should be mentioned (for example, access to resources)</p>	Include discussion of food security and potential impacts
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	K4.10-28	<p>"Additional impacts could include potentially stemming the current trend of out-migration, increasing or maintaining the number of schools in the region, and other indirect economic benefits (e.g., taxes, sales/revenue, and other fiscal effects to the regional and local communities)." This needs to be tied more directly to food, nutrition, and subsistence or moved from this section to HEC1 (SDH)</p>	Revise paragraph

ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	K4.10-28	"Although these adaptive approaches would likely sustain harvest levels for affected communities, they may increase expenses and time needed to harvest subsistence resources. ": In addition to expense/time, there could be increases in stress, accidents/injuries from potentially using unfamiliar harvest areas, and decreased availability of other resources	Include discussion of additional potential health impacts from adjustments to subsistence harvest activities
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	K4.10-10	"Once constructed, the transportation corridor roads and the natural gas pipeline right-of-way could have a positive effect on access to subsistence resources (depending on the level of access agreed to between the State, PLP, and the LPB); because these cleared routes could facilitate overland travel by all-terrain vehicles and snow machines. The ferry could also facilitate access to subsistence resources by transporting local residents and their vehicles across the lake. PLP would work with local communities to find solutions for ferry transportation use (PLP 2018-RFI 027). Under the summer-only ferry operations variant, the ferry would not impact cross-lake local transport.": This has a lot of other implications, which should be addressed in other HECs, such as accidents and injuries. Also, these statements contradict other HECs, which needs to be addressed	Clarify whether roads, ferries, etc. will be potentially available for public use. If so, this also needs to be addressed in other HECs, especially accidents/injuries, infectious disease, SDH
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	K4.10-28	The paragraph starting with "The evaluation presented in Section 4.9 Subsistence..." seems to imply that roads, ferries, etc. may be used by the public. This could decrease availability of subsistence resources, as there may be more pressure from hunters, especially if workers can also use the locations for hunting. If employees are prohibited from hunting/fishing/etc. in the area, that needs to be mentioned. This needs to be clarified and expanded upon.	Add clarifications and additional information relating to the interactions of public/workers on features of the project transportation corridor and the potential impacts to subsistence resources due to increased competition
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	K4.10-28	Actual/perceived decrease in salmon quantity in Bristol Bay , impacts to commercial fisheries, and related impacts to human health should be addressed in this HEC and also in SDH (as many people in the broader PACs are also impacted by this)	Add discussion of actual/perceived decrease in salmon quantity in Bristol Bay, as well as impacts to commercial fisheries. Also add to SDH
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	K4.10-29	Food security should be discussed in greater detail in this summary of the HEC. Positive and negative effects are possible. Also, as mentioned in a previous comment, cost of living does not equal food security. There are other components to food security and these should be mentioned (for example, access to resources)	Add discussion of food security as a separate potential health impact
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	Table K4.10-4	Food cost and food security should be considered separately	Rate/rank food cost and food security separately (add new row for this potential impact)
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	Table K4.10-4	Edits needed to "potential impact of increased food security (expressed as a cost of living)". Food security may also decrease and food security isn't merely an issue of cost of living.	Suggested edit: potential impact of increased change in food security (expressed as a cost of living)
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	Table K4.10-4	In a new row for "change in food security", this potential impact is +/- and should be rated appropriately	Acknowledge that food security may increase or decrease, depending on multiple household factors

ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	Table K4.10-4	Row of subsistence access/quality/quantity: Magnitude is better represented as a 1 or 2 instead of 0. Throughout the EIS, there is reference to impacts such as decreased access to subsistence resources, impacts to subsistence because of noise, etc. These are factors which could result in impacts that individuals/households will need to adapt to in order to ensure they have adequate subsistence resources for food/cultural activities/etc. This will be particularly evident in households which will not benefit from employment and cannot as easily supplement smaller subsistence harvests with store-bought foods	Revise row with increased magnitude of potential impact
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	Table K4.10-4	Row of subsistence access/quality/quantity: Health effect for transportation corridor (T) should be 1 instead of 0. Throughout the EIS, there is reference to impacts such as decreased access to subsistence resources, which could impact communities with traditional use of land within the transportation corridors for subsistence activities	Revise row with increased health effect rating for transportation corridor
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.4	Table K4.10-4	Row of subsistence access/quality/quantity: Geographic extent for construction and operations may be better represented as 2 (community-level) rather than 1 (limited to households), given the high levels of sharing harvests with other households, and also given the detailed potential impacts in Section 4.9 Subsistence for each of the 6 PACs in closest proximity.	Revise row with increased geographic extent for construction and operations
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.7	K4.10-37	The Chronic Disease Impacts from Exposure to Hazardous Chemicals section does not discuss the hazards posed by exposure to metals through subsistence foods (after bioaccumulation/biomagnification). Chronic exposure to heavy metals is linked to a number of neurodegenerative disorders in adults, and neurobehavioral disorders in babies and children. Subtle effects on cognition and behavior can occur at lower developmental exposure concentrations than previously thought, so it's important to provide these subsistence communities with all available information.	Recommend discussing potential impacts on the incidence of neurodegenerative disorders in adults (e.g., Parkinson's Disease, Alzheimer's, ALS) and neurobehavioral disorders in developing fetuses and children to this section.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.5	K4.10-31	"PLP would likely conduct worker code of conduct training, and implement a closed work camp and workforce health education programs that would promote awareness of infectious diseases and preventive measures. The project would likely provide a place where workers who have infectious diseases (of any kind) could be diagnosed and treated, and measures would be taken to avoid transmittal of diseases to others." This would indeed help prevent transmission of infectious disease. Consider adding this as a mitigation or highlighting in EIS as a best practice	Add as a mitigation

ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.5	K4.10-31	Mention somewhere in this section whether the worker camps are expected to be closed camps or not, who is allowed access on roads, etc. This has implications for potential infectious disease impacts.	Add additional workforce information
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.7	Table K4.10.5	Row of increase in infectious disease, geographic extent column: Change the word partners to household. Families could also be impacted	Edit geographic extent wording of this row
ADHSS/DPH/SOE	Appendix K4.10	Figure K4.10-1	Figure K4.10-11	Suggest evaluating adults and embryos/infants/children separately under human receptors due to differential toxicity/sensitivities. There are also additional, significant routes of exposure for these populations; most notably, maternal transfer. This should be included as an exposure route for babies/young children in this figure, and others where appropriate.	Suggest modifying figure to include adults, and embryos/infants/children as separate human receptor categories. Add maternal transfer as an exposure route.
ADHSS/DPH/SOE	Appendix K4.10	Figure K4.10-2	Figure K4.10-2	Suggest evaluating adults and embryos/infants/children separately under human receptors due to differential toxicity/sensitivities. There are also additional, significant routes of exposure for these populations; most notably, maternal transfer. This should be included as an exposure route for babies/young children in this figure, and others where appropriate.	Suggest modifying figure to include adults, and embryos/infants/children as separate human receptor categories. Add maternal transfer as an exposure route.
ADHSS/DPH/SOE	Appendix K4.10	Table K4.10-14	K4.10-45	Recommend adding neurological diseases to Alternative 1 and variants column (and other similar figures). Suggest including language addressing differential risk (if any) for sensitive populations.	Recommend adding neurological diseases to Alternative 1 and variants column. Suggest including language addressing differential risk (if any) for sensitive populations.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.7	Table K4.10-11	Increase in cancer...hazardous chemicals row: Edit likelihood rating for mine-- currently has missing numbers	Revise likelihood rating (fix error)
ADHSS/DPH/SOE	Appendix K4.10	Table K4.10-11	K4.10-38	Recommend adding neurological diseases to potential impacts row. Suggest including language addressing differential risk (if any) for sensitive populations.	Recommend adding neurological diseases to potential impacts row. Suggest including language addressing differential risk (if any) for sensitive populations.
ADHSS/DPH/SOE	Appendix K4.10	K4.10.2.8	K4.10-39	Comments on impacts to routine healthcare could be supported with examples, such as with data from Red Dog	Consider adding additional detail
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.10.2	4.10-4	List all PACs to provide better context to discussion of potential impacts/ratings. Also add why they are a PAC (proximity, employment, subsistence, etc.)	Add a table or figure identifying all PACs and why included as a PAC
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.10.2	Table 4.10-3	Revise/update table based on comments received for the individual HEC impact rating tables in Appendix K.4.10	Revise/update table for consistency with Appendix K.4.10 tables
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.10.2	4.10-6	Edit sentence: Overall, the economic and health benefits of improvements in economic status would be considered substantial for the residents of the affected communities.	Suggested edit: Overall, the economic and health benefits of improvements in economic status would is expected to be considered substantial for the residents of the affected communities.
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.10.2	4.10-6	Revise narrative based on comments received in Appendix K4.10 (for example, food cost and food security should be rated separately and have +/-, subsistence impacts are 2)	Revise 1st and 2nd paragraphs of page
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.9.2.4	4.9-8	The predicted number of employees from surrounding communities presented in the first paragraph of this section would be useful to include in 4.10 and K4.10 as they add context, especially to SDH	Add predicted number of employees from surrounding communities to relevant parts of Health and Safety sections

ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.9.2.4	4.9-9	The discussion on out-migration due to employment at Red Dog appears to contradict the "stemming of out-migration" discussed in K4.10.2.4 (page K4.10-28). Potential increase of out-migration and subsequent potential impacts on health should also be discussed in K4.10.2.4	Add potential increase of out-migration and related health impacts to Health and Safety sections
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.2.3	4.4-6	It may be useful to add examples from other mines, such as Red Dog, to the discussion of impacts to implement, incomes, educational attainment, etc.	Add existing relevant examples from other projects, if possible
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.2.3	4.4-6	"...there may be additional stress over perceived impacts to fish and the quality of the fish resource, associated with construction and operation of the project." ": this point needs to be addressed in detail in HEC1 SDH	Add potential increased stress from real/perceived impacts to fish quality/quantity to Health and Safety sections, especially social determinants of health
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.2.3	4.4-6	"Impacts on access to and quantity of subsistence resources could be both adverse and positive to health and safety, and many of these effects would be most noticeable to minority and low-income communities in close proximity to the mine site and transportation corridor.": This supports the comment submitted by ADHSS to increase the geographic extent of potential impacts to subsistence	Revise row in Table K4.10-8 with increased geographic extent for construction and operations
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.1.3	4.4-3	Due to uncertainty associated with emissions estimates, complex interactions between multiple contaminants, biomagnification, and the presence of additional environmental stressors, recommend erring on the side of caution and using the phrase "real or perceived effects" or "potential effects" rather than "perceived effects" in the last sentence of the health and safety paragraph.	Consider revising phrasing to "potential impacts on salmon" or something similar. Consider including other wildlife used for subsistence purposes.
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.2.3	4.4-5	The phrase "changes in cultural perceptions of resources (e.g., fish and animals are seen as tainted-contaminated...", does not capture the inherent uncertainty involved in these large-scale, multi-stage, complex projects that directly impact natural resource deposits.	Suggest using the phrase "real or perceived changes in ..."
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.2.3	4.4-6	The phrase "there may be additional stress over perceived impacts to fish and the quality of the fish resource" does not capture the inherent uncertainty involved in these large-scale, multi-stage, complex projects that directly impact natural resource deposits.	Suggest using the phrase "real or perceived changes in ..."
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.2.3	4.4-6	spelling error "recourses" should be "resources"	correct spelling of "resources"
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.2.3	4.4-7	Recommend discussing the risk of neurobehavioral/cognitive disorders posed by exposure to maternally-transferred contaminants in the context of environmental justice.	Recommend discussing the risk of neurobehavioral/cognitive disorders posed by exposure to maternally-transferred contaminants in the context of environmental justice.
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	4.4.6.2	4.4-12	Changes in subsistence resources can also include quality and safety	Recommend adding a "quality/safety of subsistence foods for consumption" section to discussion.
ADHSS/DPH/SOE	Chapter 4: Environmental Consequences	Table 4.4.1	4.4.9-4.4.10	"Perceived" risks may also be real	Consider replacing with "real or perceived risk"