EPA Comments – Pebble Project Preliminary Draft EIS, Section 4.18 – Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
EPA	1	3.18 and 4.18 - General	General comment on baseline data, analysis area, and modeling.	The baseline studies are summarized in this section and in Appendix K3.18. We have the following overall recommendations related to section 3.18 and 4.18: • Clearly define the area of analysis for the baseline studies and impact analysis for this resource for all project components and alternatives; and • As recommended in our previous comments submitted to the Corps on 7/5/2018, please describe whether there are data gaps with the existing baseline studies for the proposed action and alternatives. If there are gaps, we recommend discussing whether there will be additional monitoring and when it will be included in the EIS. If no additional monitoring is planned, then describe the extent to which any data gaps affect characterization of the affected environment (section 3.18) and the impact analysis (section 4.18).	• Revised text to provide definition of the analysis area. Clarifying text has been added to distinguish between affected environment discussion relative to various alternatives and variants. Additional detail on affected environment specific to Alternatives 2 and 3 are included in Appendix K3.18. • A data gap analysis was conducted prior to development of the DEIS.
EPA	2	Section 4.18, Page 4.18-1	Effects due to reagents	Xanthate and other processing reagents listed in Chapter 2 are not captured in the water quality modeling and are not discussed in Section 4.18. We recommend that this section of the DEIS describe whether and to what extent the mine processing reagents could impact surface water or groundwater quality and the procedures that would be in place to	Protection of surface and groundwater from impacts associated with mine contact water, including water potentially containing xanthate or other processing reagents, would be accomplished by capturing and treating water prior to discharge as detailed in Section 4.18.

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				monitor (e.g., toxicity testing of effluents) and mitigate impacts.	
EPA	3	Section 4.18, Page 4.18-1	Effects on drinking water sources.	Section 3.18 describes the water quality of existing drinking water sources in the project area. However, Section 4.18 does not directly discuss whether the proposed project could impact drinking water quality in these existing sources, with the exception of a brief reference in Table 4.18-1. The discussion on impacts to drinking water sources appears to be limited to discussion of new drinking water wells that would be developed to support the project. We recommend the DEIS include analysis and discussion of the potential for impacts to existing public and private drinking water sources.	There are currently no drinking water wells in the vicinity of the mine site, and groundwater or surface water that currently serves as a drinking water source distant from the site is not expected to be impacted. Surface and groundwater quality would be protected through containment and treatment of all mine contact water prior to discharge to the environment.
EPA	4	Section 4.18.2.1, Page 4.18-2	Figure showing outfall locations	Outfall locations are provided in Figure 4.16-1. Due to the scale of the figure, it is difficult to discern the outfall locations in relation to the surface water monitoring stations. We recommend that an additional figure be provided in the DEIS that shows a close-up of each outfall location in relation to the nearby surface water monitoring locations and tributaries.	Figure 4.18-1 showing discharge locations has been added to the text as requested, and text has been updated accordingly.
EPA	5	Section 4.18.2.1, page 4.18-2	All runoff water contacting the facilities at the mine site and water pumped from the open pit would be captured to protect overall downstream water quality.	Following this sentence, we recommend including a summary sentence on contact water that infiltrates to groundwater. Also, we recommend that the DEIS include a sentence (with reference to where more information can be found)	Additional information has been added to text indicating that contact water that may infiltrate into the groundwater system at the mine site will be collected at the mine site by the open pit dewatering wells or by pumpback wells located around the mine site. The intent of the referenced sentence is to

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				that indicates what proportion of contact water is expected to manifest as surface runoff versus infiltrate to the groundwater. Such a statement is important to provide context for the sentence on 4.18-2 indicating that all of the runoff water will be captured. Finally, we also recommend adding the same sentence to Chapter 5, along with the details for how this water would be "captured" and what would be done with it (e.g., directed to a holding pond; treated and released; reference to a map indicating the location of discharge – Figure 4.16-1 shows diversion channels and collection ditches, but not effluent locations).	describe the overall process by which contact water potentially impacted by mining activities will be contained, collected, and treated prior to discharge. A sentence has been added to refer to Sections 4.16 and 4.17 for additional detail on surface water and groundwater hydrology, respectively. Noted. Information regarding capture and treatment of water at the mine site is included in Table 5-2 (Applicant's Proposed Mitigation Incorporated into the Project). New Appendix K4.16 contains figures and tables showing water balance model pathways, and Figure 4.18-1 has been added to show effluent locations.
EPA	6	Section 4.18.2.1, Page 4.18-2	Non-acid-generating quarry or waste rock would be selected and used in construction of mine site roads and embankments, utilizing techniques commonly used for grade control in open pit mines (PLP 2018-RFI 021c), such as testing for acid rock drainage (ARD) and metals at specified intervals or block sizes.	Section 3.18.1.1 mentions that some metals are mobile under neutral conditions. Therefore, we recommend that the DEIS explain how the selection and testing of construction materials will ensure that metals will not leach from these materials under neutral pH conditions.	Text clarified to indicate that testing for ARD potential and leachable metals would be conducted on material to be used for construction. It is notable that the referenced text addresses activities that would occur within the mine site area and within the contact water/groundwater capture zone, and if leaching were to occur, the impacted water would be contained and treated prior to discharge to the environment.
EPA	7	Section 4.18.2.1, Page 4.18-2	Water diversion, collection, and treatment systems would be installed to address the	We recommend that the DEIS include details and figures that show where these would be constructed, direction of flows, etc. for the construction	Text has been clarified to indicate that specific locations for all construction phase water quality protection features and BMPs have not yet been determined, but would be located to

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			effects of ground disturbance and erosion on water quality during construction. Best management practices (BMPs) for water management and sediment control structures, including temporary settling basins, and silt fences, would be installed to accommodate initial construction at the mine site."	period. We also recommend adding the details from these 2 bullets to Chapter 5, Table 5-2.	minimize erosion and sedimentation impacts. Details have been added to Chapter 5.
EPA	8	Section 4.18.2.1, Page 4.18-3	Paragraph: "Effects of dewatering water discharge in construction" Statement "Following module WTP processing, water would be discharged to the South Fork Koktuli River (SFK) catchment"	We recommend including the details for mitigating effects that are included in this paragraph (e.g., temporary sedimentation pond, tank or sand separator; chemical addition; modular treatment) to Chapter 5, Table 5.2. We recommend adding reference to the figures (4.16-1 and additional figure requested in our comments above on this section) showing locations of discharge points for treated water. It would also be helpful to show anticipated flows to be discharged on the maps, or, at a minimum, refer a reader to where this information is located.	Noted. The text describes the features of the modular WTP that may be employed as needed. Some information on WTPs is included in Table 5-2; however, the table is intended to provide PLP's most substantive design features, and excessive detail is not likely to be informative to the public, nor useful to the decision maker. USACE will include this requested measure with all additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period. Figure 4.18-1 reference added to text. Figure 4.18-1 depicts WTP discharge locations.
EPA	9	Section 4.18.2.1, Page 4.18-3	Paragraph titled: "Effects of waste rock/tailings storage and water management ponds"	We recommend including the details for mitigating these effects (e.g., containment, recycling/reuse) in Chapter 5, Table 5.2.	Information on these effects has been added to Table 5-2.

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EPA	10	Section 4.18.2.1, Page 4.18-3	…pyritic tailings would remain fully submerged in the lined pyritic TSF to minimize ARD and ML. The water over the pyritic tailings would be maintained sufficiently deep to minimize aeration of the water column, resuspension of tailings by wind-induced waves, and oxidation of the tailings. Excess water from the pyritic TSF would be pumped to the main WMP.	We recommend that the DEIS provide a reference or discussion to disclose how the oxygen content of the water was predicted. From the description in the text, it sounds like the oxygen content would be low because the water will be deep. We recommend providing information on how deep the water will need to be in order to create thermal stratification and oxygen depleted conditions in the water overlying the tailings. Anecdotally, we note that it does not seem likely that the water depth in a storage facility would be sufficient to allow for a low oxygen content above the tailings to develop; therefore, we recommend that additional information be provided to make this case, or consider reanalyzing (or collecting) the necessary data in the event that a different conclusion may be reached. We also recommend providing an estimate of the depth of the water that will cover the tailings to understand what is meant by “sufficiently deep.” We assume that pumping excess water is necessary to mitigate the potential for overtopping during operations and recommend that this be clarified in the document. We recommend that details for mitigation measures within these sentences be captured in Chapter 5, Table 5-2. Currently, only the pit is discussed in Chapter 5 with	Text has been clarified to indicate that the purpose of submerging tailings would be to prevent oxidation, and sufficient water coverage would be maintained to prevent resuspension and/or oxidation. The text was not intended to describe oxygen content of the water as a function of water depth, nor was it intended to suggest that depletion of DO concentrations is required. Text has been further clarified to indicate that the minimum depth criterion is "sufficient to prevent oxidation," as opposed to a numerical depth. Noted. Information on freeboard in the pyritic TSF that would mitigate the risk of overtopping is included in Table 4.16-1.

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				overtopping in closure and the bulk TSF for spill risk in operations/closure. We recommend adding discussion of mitigation measures for reducing the impact of overtopping risk for the pyritic TSF to Chapter 5, Table 5-2.	
EPA	11	Section 4.18.2.1, Page 4.18-4	Based on the geochemical analysis of source rock, the chemistry of runoff from rockfill in embankment dams is expected to be comparable to that of natural surface water and groundwater, with two possible exceptions (SRK 2018d):	SRK 2018d is not included in the references section; therefore, these predictions cannot be evaluated. We recommend including SRK 2018d in the reference list.	Addressed; SRK (2018d) has been added to the reference section and is available on the Pebble Project EIS website.
EPA	12	Section 4.18.2.1, Page 4.18-4	The main embankment at the bulk TSF would operate as an unlined flow-through facility. Water collecting in the bulk TSF would flow through the embankment to the main embankment's seepage collection pond (SCP). From there, water would be directed either to the main WMP for use in the mill, or to the main WTP (WTP#2) for treatment and discharge. Excess surface water in the bulk TSF would be similarly managed	We recommend clarifying whether the last reference to the bulk TSF should be pyritic TSF since the previous text already discusses the bulk TSF.	Addressed; second reference of bulk TSF has been updated to pyritic TSF.

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EPA	13	Section 4.18.2.1, Page 4.18-4	"The size of the ponds and the design criteria intended to prevent overtopping of pond water are described in Section 4.16, Surface Water Hydrology. Upset conditions that could lead to unexpected release of pond water to the environment are addressed in Section 4.27, Spill Risk."	No measures are discussed in Table 5-2 to mitigate for the risks of spills from any of the ponds and Chapter 4.27 is not available to determine what measures are discussed there. We recommend adding the details of mitigation measures to reduce the impacts of overtopping ponds to Chapter 5, Table 5-2.	Noted. Section 4.27 includes discussion of the EIS-Phase FMEA (AECOM 2018l), which considered the risk of release from overtopping.
EPA	14	Section 4.18.2.1, Figure 4.18-4	"Effects from Embankment Rockfill Runoff…This rock would be managed separately based on PAG classification and would be used only in limited locations on the northern embankment of the pyritic TSF where runoff would be directed to the main WMP."	We recommend that the DEIS include the details in the discussion of what would be done to mitigate the effects from this rock in closure/post closure.	As described in the text of this section, the chemistry of runoff from rockfill embankments is expected to be comparable to natural surface and groundwater conditions, with two possible exceptions: PAG rock and rock containing explosive residue. PAG rock would be placed in the open pit and submerged at closure, eliminating the ARD potential, and no residual explosive residues would be expected to remain at closure.
EPA	15	Section 4.18.2.1, Page 4.18-4	Rock containing explosive residues. Explosives used during mining would consist of ammonium nitrate/fuel oil (ANFO) mixtures manufactured on site (PLP 2018d). This rock would be monitored until explosive residues have been leached	It isn't clear from the text how rock containing explosive residues would be managed and monitored. We recommend that the DEIS provide details for where these rocks would be placed, how leachate would be collected, how the leachate would be managed (e.g., treatment), and the specific monitoring and criteria that would be used to determine that the explosive residues have leached so	The referenced text refers specifically to rockfill embankment runoff. Text has been clarified to indicate where monitoring would occur to assess explosive residues potentially leaching from this material. Text has been clarified. Explosive residues were considered in evaluating changes to water quality (SRK 2018a). Noted. Nitrate is a factor that needs to be considered in design of treatment systems, but

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				that the rock is safe for placement. These details are necessary to understand the effectiveness of this mitigation measure and determine water quality impacts due to explosive residues. We recommend that these rocks be placed where any leachate will be directed toward a storage pond for treatment so that ammonia, nitrate, and fuel oil are not released to the groundwater, surface water, or soils in the area. We recommend that this section discuss the extent to which explosive residuals were estimated and disclosed in predicting changes to water quality. We recommend that details regarding management of rock containing explosive residues and treatment and disposal of leachate be added to Chapter 5, Table 5-2. We note that water treatment of selenium by a fluidized bed reactor (FBR) is inhibited by the presence of nitrate – nitrate must be used up by the bacteria before selenate will be reduced. We recommend that the DEIS consider this factor given the water treatment proposed. http://www.envirogen.com/files/files/ETI_Selenium_GrayPaper_V_FINAL.pdf	it would not be considered to be present in sufficient quantity to prevent biological selenium removal from functioning. Nitrate residues should be a consideration in the sizing of the system.
EPA	16	Section 4.18.2.1, Page 4.18-4	Should a small spill occur, effects on the surrounding environment would be	We recommend that a preventative maintenance program also be included as an “implementing control” since	Noted. Table 5-2 is intended to provide PLP’s most substantive design features, and excessive detail is not likely to be informative

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			minimized by implementing controls, including automatic shutoff devices, and in-place spill response equipment and procedures (PLP 2018d). Section 4.27, Spill Risk, describes the potential for and effects of a large hydrocarbon spill.	smaller spills can be prevented if hoses, especially on large equipment, are replaced before they have a chance to burst. We also recommend adding discussion of shutoff devices to Chapter 5, Table 5-2. Please provide details for mitigation of impacts from contact and runoff water during construction to Chapter 5, Table 5-2.	to the public, nor useful to the decision maker. USACE will include these requested measures with all additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period.
EPA	17	Section 4.18.2.1, Page 4.18-5	Water treatment – "There is some concern, however, that salt and selenium could build up over time in the pyritic TSF, which has the potential to lead to increased TDS concentrations that would require treatment in the main WTP".	Our assessment is that this concern is likely to occur, since the concentrated residual waste solids from both treatment plants will be added to the pyritic TSF. This also may be a concern with the oxidized and reduced sludges produced during other steps in water treatment also being added to the pyritic TSF. Whether metals, metalloids, and non-metals will be released from those waste streams will depend on whether they are held under the same conditions as when they were formed. Oxic precipitates (e.g., ferric oxyhydroxides – along with any sorbed metals/metalloids) can be expected to be reductively dissolved if in reducing conditions; reduced precipitates (e.g., amorphous elemental selenium, metal sulfides) can be expected to re-dissolve if in oxidizing conditions. Increased ionic strength (higher TDS) will cause release of ions sorbed to precipitates if they are not chemically bonded. Ions	Noted. Additional text on WTP issues and suggestions for further investigation and potential design changes as an adaptive management strategy to manage salt loading have been added to Appendix K4.18.

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				released will become re-sequestered as either oxidized or reduced solids (or re-sorbed to another solid) depending on their final environment, but this may take some time.	
EPA	18	Section 4.18.2.1, Page 4.18-5	The open pit WTP would also include biological selenium removal	We recommend that the document explain whether this WTP technique has been utilized at other mine sites, in particular for the proposed treatment rates. If it has been utilized elsewhere, please explain how the differences in temperature at the Pebble site would affect the biological activity associated with Se removal, as well as describe whether the effect of temperature on the efficiency of Se removal using this technique has been evaluated.	This technique has been applied at other mine sites, and in general, the temperature issue does need to be accounted for in the design. Heating may be required to bring the temperature to a minimum of 5°C for the biological treatment process. Text has been added for clarification.
EPA	19	Section 4.18.2.1, Page 4.18-5	discharge water from both WTPs is currently expected to meet ADEC criteria	We recommend that the DEIS provide a comparison with expected APDES permit effluent limitations in addition to ADEC criteria.	It is expected that the most stringent ADEC water quality criteria that are the basis of the referenced comparison meet or exceed criteria that would be issued under an APDES permit.
EPA	20	Section 4.18.2.1, Page 4.18-5	Treated water from the WTPs would be used to supply process needs, and the remainder would be discharged to the environment downstream of the mine site. All WTP#1 treated water and most WTP#2 treated water would be discharged, and a small portion of the WTP#2 treated water would be used for process and	These two sentences seem to contradict each other. We recommend that the DEIS clarify whether the first (which seems to indicate that process needs would be a large use of water) or the second (which states that only a small portion of the water would be used in the process) is reflective of the expected conditions on site.	Addressed. Conflicting text removed and statement edited for clarification. All WTP#1 treated water and most WTP#2 treated water would be discharged to the environment downstream of the mine site, and a small portion of the WTP#2 treated water would be used for process and power plant needs.

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			power plant needs.		
EPA	21	Section 4.18.2.1, Page 4.18-5	Water from both treatment plants would be strategically discharged in a manner that would optimize downstream aquatic habitat, based on modeling and monitoring during discharge (PLP 2018d).	As noted in our comments on section 4.16, we recommend that additional details be provided in the DEIS to understand how this water discharge would be implemented during construction, operations, and closure. Also, our review finds that PLP 2018d is not currently provided in the list of references.	It is unclear what specific additional details are being requested. The EIS currently describes the treatment and discharge process during each phase of the project (e.g., identifies discharge locations, discusses impacts to flow, water chemistry and water temperature from discharges to individual drainages, and assesses potential impacts on fish habitat). PLP (2018d) has been added to Chapter 9 and is available on the project website.
EPA	22	Section 4.18.2.1, Pages 4.18-5 and 6	ADEC regulates wastewater discharges from hard-rock mining facilities through various permits:	We recommend clarifying that an APDES permit would be issued unless the discharge is not to WOTUS, necessitating a domestic wastewater discharge permit.	Addressed. Text has been updated to include additional information. An APDES permit is necessary and would be issued unless discharge is not to WOUS, in which case a domestic wastewater discharge permit would be required.
EPA	23	Section 4.18.2.1, Page 4.18-6	"Additionally, installing engineered discharge chambers at discharge points would reduce effects on certain water conditions such as turbidity and dissolved oxygen by baffling the discharge and allowing for more equilibrium of water condition at the discharge point."	Discussion of discharge chambers is also included in Table 4.18-1 (with respect to groundwater) and on Page 4.18-13 (with respect to erosion). We recommend adding this mitigation measure to Chapter 5, Table 5-2, and note that discharge chambers are also a mitigation measure for water/sediment quality and for fish.	Noted. Table 5-2 is intended to provide PLP's most substantive design features, and excessive detail is not likely to be informative to the public, nor useful to the decision maker. USACE will include this requested measure with additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period.
EPA	24	Section 4.18.2.1, Page 4.18-6	Some waterbodies may also have site-specific water quality criterion.	We recommend that the DEIS either clarify that no waterbodies in the project area have site specific criterion or delete this sentence as it is not applicable to the project. We note that if a request for site specific water	Addressed; sentence removed.

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				quality criteria is to be made, there is an established process to follow with the state and the EPA.	
EPA	25	Section 4.18.2.1, Section 4.18-7	Appendix K4.18 provides the methodology used to calculate the incremental increase in surface water and Table K4.18-12 shows the results.	From reading the description in the Appendix, it does not appear that loading to surface water from soil runoff is included in the calculations; however, this may be a relatively large flux since the settled dust to the terrestrial landscape will be more mobile than native soil particles. We therefore recommend that it be considered in the analysis.	Comment noted. Water quality modeling does not specifically consider sediment load; however, sediment and dust runoff impacts to surface water quality are assessed separately.
EPA	26	Section 4.18.2.1, Page 4.18-7	The results indicate a small expected increase in the concentration of metals in surface water as a result of dust deposition, ranging from 0.1 to 0.7 percent, which would not result in exceedances of the most stringent water quality criteria	While fugitive dust alone would not be sufficient to exceed a WQS, it is not clear if the additive effect of fugitive dust and WTP outflow were evaluated cumulatively. We recommend providing a Table showing the cumulative concentrations and loadings from these sources as compared to current conditions and the criteria.	Addressed, text has been updated to include the predicted range of increases of constituent concentrations from to dust deposition, which would not result in exceedances of the most stringent water quality criteria in background conditions or WTP outflow conditions.
EPA	27	Section 4.18.2.1, Page 4.18-7	Effects from deposition of fugitive dust and Effects from dust suppression water	These sections discuss impacts of dust on water and sediment quality, but dust is only presented in Table 5-2 with respect to air quality. We recommend adding details for mitigation of impacts from dust (and suppression water) to Chapter 5, Table 5-2.	Noted. Section 5.2.1.2 (BMPs) includes a description of dust mitigation.
EPA	28	Section 4.18.2.1, Page 4.18-7	"…water level in the open pit would be maintained to allow controlled placement and management of the	We recommend adding this mitigation measure to prevent oxidation of the pyritic tailing in the pit during placement to Chapter 5, Table 5-2,	Noted. Information on subaqueous storage has been added to Table 5-2.

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			PAG waste rock in dry areas of the pit, while keeping a water cover over the submerged pyritic tailings."	along with detail for the water level in the pit during this stage of filling the pit with mining wastes.	
EPA	29	Section 4.18.2.1, Page 4.18-7	"…maximum management level…"	We recommend providing a numerical estimate of the water level referred to here.	Addressed, text has been added providing additional information regarding the maximum management elevation of the pit lake in closure. Additional general details of the pit lake are included in Appendix K4.18, Table K4.18-12.
EPA	30	Section 4.18.2.1, Page 4.18-7	"Free water on the surface of the bulk TSF would be pumped to the main WMP through approximately year 15 post closure, then to the open pit through approximately year 50 post-closure. The bulk TSF would be graded and revegetated to direct surface runoff toward the closure spillway at approximately year 10 post-closure."	Chapter 2 states that the bulk TSF would have a dry closure. The second sentence here indicates that the TSF would be graded and revegetated (at ~ 10 years post-closure) such that water would not remain on the top of TSF but run off toward a spillway. However, the first sentence indicates there would be "free water on the surface" and that it would be pumped to the open pit from years 15-50 "post-closure." Please clarify why there would be free water on the surface of the TSF after it had been graded and revegetated or revise where necessary. In addition, we recommend providing details on the spillway and where the water will be directed.	Addressed. Paragraph has been re-organized and text has been added to clarify the statement and address the apparent discrepancy. Addressed in text, see comment above.
EPA	31	Section4.18.2.1, Pages 4.18-7 and 8	Water management and treatment during closure and post-closure is expected to minimize effects on water quality during both the physical	We recommend that the reference to Table K4.18-10 which shows treated discharge quality at closure be corrected. Table K4.18-10 shows that discharge water quality is predicted to exceed water quality criteria for	Addressed. Clarification from Knight Piésold was received in RFI 106. Table has been removed and information in Appendix K4.18 has been updated to include expected WTP discharges in closure.

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			closure of the site and associated reclamation activities, as well as during long-term post-closure and associated maintenance and monitoring activities. Water quality would be monitored and the treatment process would be adjusted as needed. Table K4.18-5 provides an estimate of treated discharge water quality from the pit lake. WTP processes are expected to be effective in treating water to meet discharge criteria, although concerns regarding potential long-term increased TDS levels may require further investigation as design progresses and/or adaptive management strategies are implemented during operations (Chapter 5)	mercury and selenium. Because of these exceedances, the conclusion that the WTP processes are expected to be effective is not accurate. Given that predicted exceedances are discussed, we recommend that this conclusion be revised. We recommend that the DEIS specifically disclose predicted exceedances of water quality criteria at closure, including the magnitude, duration, and geographic extent of these exceedances downstream of the discharge points. In addition, we recommend that an alternative or variant WTP process be developed, analyzed, and included in the DEIS so that there is an alternative to the proposed action that would result in all water quality standards being met at closure.	
EPA	32	Section 4.18.2.1, Page 4.18-8	Groundwater modeling estimates that the bulk TSF would contribute about 0.2 cfs of seepage to the underlying groundwater system during and at the end of	It is not clear whether the 0.2 cfs value is a mean, maximum, etc. We recommend that the DEIS clarify this value and describe any uncertainties associated with the estimate.	The information referenced is from Piteau Associates (2018a), and a citation has been added to the text. The value of "about 0.2 cfs" is a rough estimate of the flow rate, believed to be accurate within a factor of 5. Text has been clarified.

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			mining		
EPA	33	Section 4.18.2.1, Page 4.18-9	Hydraulic containment of seepage flow from the bulk TSF would be achieved and maintained using a series of control measures (Appendix K4.15, Table K4.15-1) Groundwater modeling suggests that a sump or pumping wells with an operating elevation of 1,250 ft at the main SCP and a grout curtain with an effective hydraulic conductivity of 1x10-5 cm/s would be effective in capturing seepage (Piteau 2018)	Table K4.15-1 does not provide the details regarding the location of these seepage capturing features or the details that would support the conclusions that all the groundwater from the bulk TSF would be contained. Therefore, insufficient information is currently provided to evaluate the impacts to groundwater quality from the bulk TSF. Per our comments submitted to the Corps on 8/15/18, we continue to recommend providing additional information related to hydraulic containment. We recommend that this information include, at a minimum: (1) figures that show the location of the underdrains; (2) figures that show the locations and cross-sections of the seepage pumpback wells in relation to the plume of contaminated groundwater; and (3) a discussion of these designs in relation to the groundwater modeling that reflects the Corps' independent analysis, specific conclusions on the effectiveness of these measures, and any uncertainties.	We agree that information in Table K4.15-1 is limited on this topic; cross-reference to this table has been deleted as redundant to features described in bullets and RFI references in this section. A discussion of the potential for impacted groundwater migration beneath the SCP and related uncertainties has been added to Section 4.17 (and Appendix K4.17), and a cross-reference to that section added in Section 4.18. Text has been added to Section 4.18 to address the drainage system between the bulk TSF and SCP, and the hydraulic containment system beneath the SCP. Both are currently conceptual only (e.g., PLP 2018-RFI 006) and would be developed in final design. The primary design criterion for management of the SCP, defined as "no detectable seepage downgradient of the collection and pumpback systems," has been added to the text. Cross-references have been added to a hydrogeologic cross-section in Section 3.17 showing units between the bulk TSF and SCP, and a conceptual cross-section in RFI 006-Figure 1. A cross-reference to Section 4.17, where discussion of the potential for impacted groundwater migration beneath the SCP and groundwater model uncertainties can be found, has also been added. Text added to indicate that additional seepage collection, cutoff walls, and/or pumpback systems may be installed downstream if necessary, as determined by monitored water quality (PLP 2018-RFI 006a).

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EPA	34	Section 4.18.2.1	"…be captured by the main embankment SCP" "The main embankment of the bulk TSF would be designed to promote seepage to the SCP, thereby minimizing the volume of water contained within the tailings impoundment and promoting embankment stability" "North-flowing underdrains…Seepage pump-back wells downgradient of the three SCPs." For the pyritic TSF: "Potential leakage through the liner would be diluted by unimpacted groundwater flowing northward down the NFK east drainage, and would be intercepted by the main WMP and its downgradient seepage pumpback wells."	We recommend adding details on mitigation of seepage to Chapter 5, Table 5-2. Also, we recommend that the Corps consider whether the well field downstream from the WMP, that would intercept any leakage from the pyritic TSF going to the WMP, is sufficient to protect groundwater quality, or whether a double liner would be advised (under either or both the pyritic TSF and WMP) as an additional mitigation measure. We further recommend that this analysis be discussed in the DEIS.	Noted. Seepage mitigation has been added to Section 5.2.1.2 BMPs. USACE will include this requested measure with additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period. The measure will be added to Appendix M – Mitigation Assessment and considered by the agencies as potential permit requirements.
EPA	35	Section 4.18.2.1, Page 4.18-9	Groundwater modeling suggests that a sump or pumping wells with an operating elevation of 1,250 ft at the main SCP and a grout curtain with an effective hydraulic	Piteau 2018 is not included in the references and therefore the groundwater quality modeling cannot be adequately evaluated. We recommend that this document be added to the reference list. Also, we recommend that the model approach,	Piteau Associates (2018a) has been added to the Chapter 9 reference list and is available on the project website. Text was revised to reference discussion of the groundwater model approach, including sensitivity and uncertainty in Section 4.17, Groundwater Hydrology.

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			conductivity of 1x10-5 cm/s would be effective in capturing seepage (Piteau 2018).	evaluation, and sensitivities and uncertainties be disclosed, as described in our comments on the other models used. In addition, we recommend that the DEIS clearly describe what is meant by "modeling suggests" so that the level of confidence in this information is disclosed to agency decision makers and the public.	Addressed. Text updated.
EPA	36	Section 4.18.2.1, Page 4.18-9	The predicted concentration of constituents in groundwater beneath the bulk TSF and between the TSF and the main SCP would be similar to those listed in Table K4.18-2 and Table K4.18-3 for the main SCP.	Table K4.18-2 does not have a column titled SCP or seepage collection pond, therefore it not possible to know what predicted concentrations of constituents in groundwater are being referred to. We recommend clearly adding the necessary information to the tables referenced. Assuming the SCP may be listed as the "Pyritic Tailings Sand Wedge" column in the table, the predicted water quality would exceed WQS for numerous metals. However, given the differences in metal composition between the pyritic and bulk TSF, it seems unlikely that predicted concentrations in groundwater would be similar to those for surface water. We recommend that additional information be provided on the predicted groundwater concentrations below the bulk TSF.	Table K4.18-2 has been revised to show which column reflects anticipated conditions in the SCP.
EPA	37	Section 4.18.2.1, Page 4.18-9	Several metals, TDS, and sulfate in the main SCP are predicted to exceed baseline concentrations and regulatory criteria at	We recommend that the DEIS clearly disclose in this section which metals are predicted to exceed baseline and regulatory criteria in groundwater and the length of time over which post-	Text clarified.

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			the end of mining and the end of closure Phase 3, and thus would require continued treatment at WTP#3 in post-closure (Knight Piésold 2018d).	closure groundwater management and collection and water treatment (associated with groundwater) would be required.	
EPA	38	Section 4.18.2.1, Page 4.18-9	Pond water leaking through the pond liners would be intersected intercepted by underdrain systems included in the design of those facilities, and subsequently pumped back to the respective WMP (PLP 2018-RFI 019a); however, some water could bypass the underdrain system and seep into underlying shallow groundwater	It is not clear based on the information presented how it was determined with certainty that 100% of the TSF seepage will be collected, while for the smaller, lined WMP, it is anticipated that seepage could bypass the system and impact groundwater. We recommend including additional information in the DEIS to support the 100% seepage collection conclusion or alternatively, revising that conclusion as appropriate.	The discussion subtitled “Effects from TSF Seepage” details the process by which seepage would be directed to the SCP through a system of underdrains and sloping terrain, with secondary capture through a series of pumpback wells downgradient of the SCP. The potential for contaminated groundwater to migrate in units beneath the bulk TSF and SCP, based on uncertainties in the groundwater model, is provided in Section 4.17, Groundwater Hydrology, with a cross-reference in Section 4.18.
EPA	39	Section 4.18.2.1, Page 4.18-9	The potential for liner damage (e.g., from ice or placement of waste rock) leading to leakage of tailings porewater was evaluated in the EIS-Phase Failure Modes Effects Analysis (FMEA), and the likelihood of occurrence was considered to be low to moderate (AECOM 2018l).	AECOM 2018l is not included in the references and therefore information on the potential for leakage through the liner cannot be evaluated. Of specific interest are the predictions of number of defects/ holes per area of the liner. There are several different values for this available in the literature that could result in significant differences in terms of groundwater concentrations/impacts. Therefore, having access to this information is critical for the evaluation of the EIS and we recommend that the AECOM 2018l document be provided in the text or appendix of the DEIS for review and	AECOM (2018l) has been added to references.

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				comment.	
EPA	40	Section 4.18.2.1, Page 4.18-9	"If monitoring were to find that groundwater quality is not improving during the post-closure period, additional remedies would be implemented to capture and/or treat impacted groundwater."	We recommend that the DEIS describe the groundwater monitoring that would occur during closure/post-closure (monitoring locations, frequency, and parameters), the criteria that would be used to determine if additional remedies are needed, and details of the additional remedies that would be implemented.	Text has been revised to align with Closure Water Management Plan (Knight Piésold 2018d).
EPA	41	Section 4.18.2.1, Page 4.18-9 and 10	"Pond water leaking through pond liners would be intersected by underdrain systems included in the design of those facilities…"	We recommend adding these details to Chapter 5, Table 5-2.	Noted. Table 5-2 is intended to provide PLP's most substantive design features, and excessive detail is not likely to be informative to the public, nor useful to the decision maker. USACE will include this requested measure with additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period.
EPA	42	Section 4.18.2.1, Page 4.18-10	In a discussion of the estimated maximum leakage rate through the liner of the main WMP: "…daily leakage rate of nearly 23,000 gallons."	This seems like a lot of water to leak daily. The response to RFI 019c stated that 1 l/s equates to about 30 gallons/acre/day for each facility, which is < 480 gal/acre/day stated as being regulated for "metal laden seepage water" (https://geosynthetic-institute.org/papers/paper15.pdf). This is a lot of water to have to store in the pond, treat, and potentially not capture. We were unable to find the actual acreage for any of the mine facilities in the PLP plan (Chapter 2) and were unable to find any information about the type of liner and its hydraulic conductivity. In addition, the FMEA was not provided in the	The intent of the referenced text is to describe the anticipated leakage from the WMP, and assess the planned process for monitoring and managing that anticipated leakage. The assumed leakage rate is based on anticipated defects in a composite liner system with excellent contact between the liner and subgrade (Giroud and Bonaparte 1989; PLP 2018-RFI 019c). Text has been revised to discuss the leakage rate in context of the capture and pumpback process.

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				current document. It is unclear whether this value considers both seepage (inherent loss expected due to the hydraulic conductivity of the material) and leakage (assumed from deformities or damage to the liner), or from only leakage. We recommend that these details be discussed in the DEIS.	
EPA	43	Section 4.18.2.1, Page 4.18-10	"Based on the current mine plan, it is possible that gaps exist along the main WMP embankment that would allow potentially affected groundwater to flow through areas where wells are limited (e.g., along the southwest side of the embankment, Figure 4.16-1). As discussed in the EIS-Phase Failure Modes Effects Analysis (FMEA), the final location and spacing of pump-back wells would be determined based on additional hydrogeologic investigation as design progresses to minimize the likelihood of this occurrence."	We recommend that it may be less costly to have a better liner system (double liner to protect against defects and damage to one) than to have to pump this much water back to a pond and then have to pump it out and treat it later, not to mention needing to consider this in sizing of the pond (which results in an increased footprint). Additionally, the discussion includes that there is potential for gaps in the well network (also can see on Fig 4.16-1), which would lead to potential impacts on groundwater. We note that the best mitigation measure for groundwater impacts caused by the potential inability to capture seepage is to minimize the potential for seepage to occur. For all of these reasons, we recommend that the Corps consider an alternative, variant, or additional mitigation measures to minimize leakage from these liners (facilities), such as a double-liner system. In addition, we recommend that the DEIS include details from the additional	Noted. USACE will include this requested measure with additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period. The measure will be added to Appendix M – Mitigation Assessment and considered by the agencies as potential permit requirements. Further description of proposed future design work that would include additional site investigation and monitoring network development are described in PLP (2018-RFI 019c).

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				hydrogeologic investigation regarding well placement and consider revised or additional well placement as needed to improve the ability to capture leakage and seepage.	
EPA	44	Section 4.18.2.1 Page 4.18-10	Discussion of seepage from overburden stockpile: "…limited by segregating mineralized overburden from non-mineralized overburden, and stockpiling mineralized materials that exhibit a high potential for leaching in the pyritic TSF."	We recommend including these measures in Chapter 5.	Noted. Table 5-2 is intended to provide PLP's most substantive design features, and excessive detail is not likely to be informative to the public, nor useful to the decision maker. USACE will include this requested measure with additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period.
EPA	45	Section 4.18.2.1, Page 4.18-11	After lake level rise, groundwater gradients toward the pit would be maintained by managing the pit lake level through pumping and treating the lake water in perpetuity. With the pit water level maintained at the maximum management level of 890 ft msl, groundwater flow is expected to be directed radially toward the pit from all directions.	We recommend providing information on the volume/discharge that would be required to pass through the water treatment plant in order to maintain a pit lake level of 890 ft during periods of spring snowmelt. In order to provide context for the post-closure discharge rate, we recommend that the DEIS discuss how this discharge rate compares with the volumes of water treated during the operating phase of the mine.	Information added to text based on Piteau Associates (2018a). Information added to text.
EPA	46	Section 4.18.2.1, Pages 4.18-11 and 12	If monitoring shows that groundwater quality is not improving during the post-closure period, additional remedies would be	As noted above, we recommend providing additional information that describes the groundwater monitoring that would occur at closure/post-closure and the additional remedies	Text has been revised to align with Closure Water Management Plan (Knight Piésold 2018d).

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			implemented to capture and/or treat the impacted groundwater as needed.	that would be implemented.	
EPA	47	Section 4.18.2.1, Page 4.18-11	"Groundwater monitoring would be conducted at selected wells surrounding the pit lake to confirm that groundwater flow is toward the pit and that impacted groundwater is not migrating outside of the pit. Should monitoring find that groundwater does not flow toward the pit or that groundwater quality outside the pit is degraded during the post-closure period, the maximum management level (890 ft msl) currently proposed would be reconsidered, and the pit lake level would be lowered to maintain hydraulic containment."	Please provide information in the DEIS on the current groundwater level and flow direction in the area of the pit. We recommend that this information be provided on a figure, along with the cone of depression of the water table expected during mining operations due to de-watering. In addition, we recommend providing information on anticipated changes in pit water conditions (e.g., stratification, depths of oxygen infiltration, water turn over) and any anticipated (if there are any) influences on the covered PAG and pyritic tailings if the pit water level needs to be decreased.	Groundwater information, including the flow characteristics during all project phases and figures, have been added to Section 4.17 and Appendix K4.17, Groundwater Hydrology. Information on the anticipated water chemistry, stratification, and other relevant pit lake characteristics is provided in Appendix K4.18, and a summary is provided in Section 4.18.
EPA	48	Section 4.18.2.1, Page 4.18-11	"Placeholder: Additional information on pit lake modeling, lake stratification, and its effects on water quality was received November 1, 2018" "This information will be reviewed and incorporated in the DEIS."	Figure K4.18-01 shows the top of the PAG waste rock at 650 ft and the maximum water level at 890 ft. We recommend that the DEIS discuss the anticipated water environment for the submerged tailings and PAG and whether the 240 feet of pit water is expected to stratify and/or turn over. In addition, we recommend that the DEIS provide the depth at which water will be obtained for treating (if there is	Addressed in 4.18 and in further detail in Appendix K4.18.

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				stratification, water quality could be expected to differ at differing depths).	
EPA	49	Section 4.18.2.1, Page 4.18-12	Discussion of the effect of dewatering on wetlands in the vicinity of the mine site.	We note that previously reduced soils will become oxidized and there is the potential for the oxidized metals to be mobilized or form oxyhydroxides or be sorbed to the soils (dependent on pH and specific ions present). We recommend that the DEIS discuss the mitigation measures necessary to reduce these potential impacts to soils and groundwater.	Effects on soils are presented in Section 4.14, Soils. The effect of dewatering on soils, specifically oxidation of soils at the mine site as they become unsaturated, could affect locally affect groundwater chemistry; however, soils in this area that would be affected in this way are predominantly stripped as overburden during mining operations. Additionally, the area is within the surface/groundwater capture zone and any oxidized metals leaching to groundwater would be captured and treated prior to discharge to the environment.
EPA	50	Section 4.18.2.1, Page 4.18-12	Discussion of the effect of dewatering on wetlands in the vicinity of the mine site.	We recommend that the DEIS discuss the impacts that the erosion would have, both temporary and longer-term and describe the mitigation measures necessary to reduce those impacts. We recommend that redundant BMPs be used and/or that settling basins/ponds/ditches be sized to consider extreme events. We recommend that it is more protective to oversize these components than to undersize them based on averages.	The areas referenced are within the surface/groundwater capture zone and any oxidized metals leaching to groundwater would be captured and treated prior to discharge to the environment.
EPA	51	Section 4.18.2.1, Page 4.18-13	"However, the potential exists for erosion during periods of high precipitation and runoff to overwhelm the BMPs, resulting in an influx of fine sediment and increased turbidity into gravel-dominated	We recommend that the DEIS discuss the impacts that the erosion would have, both temporary and longer-term and describe the mitigation measures necessary to reduce those impacts. We recommend that redundant BMPs be used and/or that settling basins/ponds/ditches be sized to consider extreme events. We	Impacts from erosion are discussed. Mitigation measures to control sedimentation have been included in Chapter 5.

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			streambeds."	recommend that it is more protective to oversize these components than to undersize them based on averages.	
EPA	52	Section 4.18.2.1, Page 4.18-14	"Thus, low-intensity sediment contamination in between the removed facilities could persist at the mine site for decades in post-closure[,] potentially contributing to water quality impacts over time. To address this potential impact, Chapter 5, Mitigation, provides a recommendation for additional testing of sediment quality between facility footprints at closure."	We recommend including this recommendation in Chapter 5.	Noted. USACE will include this requested measure with additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period. The measure will be added to Appendix M – Mitigation Assessment and considered by the agencies as potential permit requirements.
EPA	53	Section 4.18.2.2, Page 4.18-14	Based on a field review of geology at material sites, PAG material has not been identified at any site along the transportation corridor, and the rock types present are not typical of PAG rock.	As noted earlier in the EIS, there are numerous metals that are mobile under neutral pH conditions (e.g. arsenic, molybdenum, and selenium). Therefore, evaluating material on the basis of its acid generation potential and not also due to the concentration of other metals/metalloids would potentially overlook water quality impacts along the transportation corridor. We recommend providing additional information to support this statement and provide a discussion of how NPAG metal leaching rock will be managed in the DEIS.	Comment noted. The material sites that would support construction outside of the mine site are not in mineralized areas and it is not anticipated that leachable metals will be a significant concern; however, mitigation including testing of material sites for leachable metals and PAG rock is included in Chapter 5.
EPA	54	Section	Surface Water: Metals	It is not clear from the text whether	Text clarified as suggested.

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		4.18.5, Page 4.18-14	concentrations in surface water predicted to increase by 0.1% to 0.7% as a result of fugitive dust deposition, although no exceedances of water quality standards are expected	these predictions include watershed loading via surface water runoff. If runoff is not included in the predictions, these percentages may be underestimates of the impacts of fugitive dust on water quality. We recommend clarifying and including additional information in the DEIS.	
EPA	55	Section 4.18.2.2, Page 4.18-15	"In addition, stormwater treatment systems would be in place at both ferry terminal locations to capture potential contaminants."	We recommend that this read "capture and treat." Page 4.18-16 discusses details for mitigation of surface runoff at the Amakdedori Port, including treatment that we recommend also be included in Chapter 5.	Text revised as suggested.
EPA	56	Section 4.18.2.3, Page 4.18-16	"The solids removed would be thickened and disposed of appropriately."	We recommend that the DEIS describe how they will be disposed.	Text clarified regarding solids disposal.
EPA	57	Section 4.18.2.3, Page 4.18-16	Section on Surface Water Quality	We recommend that mitigation details in this section also be included in Chapter 5, Table 5-2.	Noted. Table 5-2 is intended to provide PLP's most substantive design features, and excessive detail is not likely to be informative to the public, nor useful to the decision maker. USACE will include this requested measure with additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period.
EPA	58	Section 4.18.2.3, Page 4.18-16	Section on Dust Impacts on Marine Water Quality	We recommend that discussion of mitigation of dust when loading the concentrate also be included in Table 5-2.	Noted. Table 5-2 is intended to provide PLP's most substantive design features, and excessive detail is not likely to be informative to the public, nor useful to the decision maker. USACE will include this requested measure with additional measures suggested by cooperating agencies and the public to be evaluated after the Draft EIS comment period.
EPA	59	Section	A container barrier wall	We recommend clarifying whether	The referenced discussion describes planned

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		4.18.2.3, Page 4.18-16	built around the fuel tanks and a perimeter containment curb constructed around the terminal would prevent surface water runoff from these facilities and activities from reaching off-site surface water.	these barriers are in addition to any required secondary containment.	features that will contribute to stormwater management at the port site, which includes the planned secondary containment around fuel tanks (barrier wall) and a perimeter containment curb. Text clarified.
EPA	60	Section 4.18.2.3, Page 4.18-16	The clarified water would then be treated with sodium hydrogen sulfide, sodium hydroxide, and ferrous sulfate to further co‑precipitate the remaining metals under reducing conditions	We recommend clarifying whether the treatment described would be adequate to treat any discharges of hydrocarbons that could occur in the surface runoff.	Text clarified to indicate that the port WTP would treat hydrocarbons (POL), if present in runoff.
EPA	61	Section 4.18.2.3, Page 4.18-18	Marine vessel activity in Upper Cook Inlet does not appear to have contributed to measurable sediment contamination (USACE 2013).	We recommend explaining how the information on Upper Cook Inlet, which is a non-depositional area, is applicable to Kamishak Bay, which is a net depositional area in the DEIS.	Text revised to remove reference to upper Cook Inlet.
EPA	62	Section 4.18.2.4, Page 4.18-18	Surface water quality at pipeline stream crossings is expected to be within water quality standards for turbidity during construction. Natural turbidity measurements at stream crossings along the transportation corridor were mostly below the instrument's minimum detection level of 7–11	We recommend clarifying the discrepancy between the first and last sentences where one says turbidity will be within WQS and the other says there will be impacts above the WQS.	Addressed in text, text updated. Overall, surface water quality at pipeline stream crossings is expected to be within water quality standards for turbidity during construction. It is possible that isolated occurrences of impacts above this standard could occur temporarily (e.g., during high-precipitation periods along summer construction segments); however, they would likely be reduced within a short time frame because of planned redundancies in BMPs, erosion and sediment control measures.

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			nephelometric turbidity units (NTU) during 2018 field studies (Section 3.18, Water and Sediment Quality) (PLP 2018-RFI 036). ADEC water quality standards specify that turbidity levels may not exceed 5 NTU above these conditions (when the natural turbidity level is 50 NTU or less). Isolated occurrences of impacts above this standard could occur (e.g., during high-precipitation periods along summer construction segments)		
EPA	63	Section 4.18.2.4, Page 4.18-18	The extent of potential impacts from hydrostatic testing for pipeline pressure testing would be limited because the water volumes required would be small compared to the volumes of potential sources from rivers and small lakes along the route.	We recommend clarifying that this discharge would need a state authorized permit under 18 AAC 72 if it is discharged to land.	Text clarified regarding permit applicability and compliance.
EPA	64	Section 4.18.2.4, Page 4.18-19	"Section 4.16, Surface Water Hydrology, addresses the potential for sediment suspension, plume transport, and redeposition to occur	We note that no mitigation for these impacts is provided in either Table 5-2 or in Chapter 4.16. We recommend that mitigation measures be provided for these impacts and discussed in the DEIS.	Noted. General text describing erosion and sediment control to minimize these effects is included in Section 5.2.1.2 BMPs. USACE will include the requested measure specific to the marine environment with additional measures suggested by cooperating agencies and the

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			during construction in the marine environment."		public to be evaluated after the Draft EIS comment period.
EPA	65	Section 4.18.3.1, Page 4.18-19	Due to similar seepage design and downstream capture under Alternatives 1 and 2, the downstream dam alternative for the bulk TSF main embankment would likely have the same impacts on surface water and groundwater quality as centerline construction	We recommend that the DEIS provide figures that show the seepage design systems for Alternatives 1 and 2 in order to support the conclusion that impacts would likely be the same.	Figures 2-4 and 2-45 show details of Bulk TSF layout, including seepage collection system configuration. Reference has been added to text.
EPA	66	Section 4.18.3.1, Page 4.18-19	In discussion of the natural gas pipeline corridor in Alternative 2: "Impacts would be the same as described for the transportation corridor under Alternative 3 for the portion from Diamond Point to the mine site."	We note that the pipeline corridor is not discussed in Alternative 3's section on the transportation corridor and we recommend that this discussion be added to the text.	The discussion of Alternative 3 impacts includes only those elements that vary from Alternatives 1 and 2. The pipeline route under Alternative 3 is the same as the pipeline route under Alternative 2, so impacts are addressed by reference to Alternative 2. Text has been clarified.
EPA	67	Section 4.18.4, Page 4.18-21	"Under alternative 3, impacts on the pipeline corridor would be the same as those described for Alternative 2."	Section 4.18.3.4 is the "Natural Gas Pipeline Corridor." As noted in the previous comment, impacts are not described in Alternative 2 for the complete pipeline corridor. We recommend that the text be revised as necessary.	Text has been revised.
EPA	68	Section 4.18.4.3, Page 4.18-22	The water removed from the concentrate would be treated in a WTP to meet marine water quality standards and discharged through an outfall pipeline	We recommend clarifying the circumstances which would allow for a discharge of process wastewater to waters of the U.S. under the Clean Water Act and NPDES regulations (40 CFR 122.2 defines Process	PLP (2018-RFI 066) describes process wastewater discharge, specifically allowing for some process water discharge to maintain a site's water balance (referencing EPA Development Document for Final Effluent Limitations Guidelines and New Source

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			and diffuser to the marine environment.	wastewater as any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product) considering the prohibition on this type of discharge found in 40 CFR 440 Subpart J.	Performance Standards for the Ore Mining and Dressing Point Source Category, pp. 501 [EPA November 1982]). Any discharge to WOUS would be under permit and within established regulatory framework.
EPA	69	Page 4.18-23, Table 4.18-1	**Surface Water**: Ground disturbance and fill placement could result in increased turbidity in local waterbodies and streams, to be mitigated through BMPs. **Groundwater**: Metals concentrations in shallow groundwater may increase as a result of the disruption of wetlands and fill placement	In order to understand the significance of these impacts, we recommend that these sentences be expanded to list the metals that would be exceeded in groundwater and the areal extent and depth of exceedances. For surface water, we recommend describing the magnitude of the turbidity exceedances and geographic extent (which waterbodies and how far downstream).	Table 4.18-1 is intended to summarize key issues. Specific details supporting those key issues (including specific metals that may increase due to wetland dewatering and assessment of turbidity and sedimentation effects) are included in the text of Section 4.18.
EPA	70	Page 4.18-24, table 4.18-1	**Groundwater**: Local impacts on shallow groundwater quality in the NFK west, east, and north drainages are likely from vertical seepage through the bulk TSF, or leakage through the pyritic TSF or WMP liners. This would result in localized exceedances of water quality standards within the mine site footprint,	As noted above, we recommend that the DEIS lists the parameters that would be exceeded in groundwater and the areal and vertical extent as well as the duration (years).	Specific parameters are now listed in the text of Section 4.18. Table 4.18-1 retains the list of key issues.

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EPA	71	Page 4.18-25, Table 4.18-1	Fugitive dust effects	We recommend summarizing the areal extent of fugitive dust impacts on groundwater for all of the alternatives.	Addressed. Statement added to explain the modeled areal extent of dust deposition in construction and operation phase of the mine site is depicted in PLP (2018-RFI 065).
EPA	72	Page 4.18-24, Table 4.18-1	Pit lake water quality would exceed water quality standards but would be pumped to maintain operational levels and treated prior to being discharged to the environment.	As we have commented previously, we recommend that this be revised to disclose that mercury and selenium discharges would exceed water quality standards at closure. As noted above, we recommend that the magnitude of these exceedances be disclosed, including the geographical extent downstream, and the duration of the impact.	The table showing expected exceedances of discharge criteria for mercury and selenium were in error and have been corrected in the DEIS.
EPA	73	Page 4.18-26, Table 4.18-1	Localized increase in turbidity at approximately 100 stream crossings.	We recommend that the DEIS describe what is meant by "localized" or provide the estimated extent of impacts and define the magnitude of the increases so that the significance can be understood by agency decision makers and the public. In addition, we recommend that the table summarize whether impacts during operations would be different than construction.	Text clarified to define "localized" and distinguish construction phase from operations phase.
EPA	74	Pages 4.18-26 to 27, Table 4.18-1	Construction vs operations impacts	We recommend that impacts from construction and operations for the road, ferry, and port site components be summarized separately since it is otherwise unclear which activities are resulting in the impacts and the duration of impacts.	Text clarified to distinguish between various phases of the project.
EPA	75	Section 4.18.6, Page 4.18-29	"Pebble Project buildout – development of 55 percent of resource over a	No analysis has been provided in the cumulative effects section to support these conclusions. We recommend	The analysis of cumulative effects has been revised and expanded to include details on RFFAs including the Pebble Mine expanded

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			78-year period" The buildout would correspond to an increase in the magnitude and local extent of ground disturbance impacts and fill placement on substrate, with a duration increase of up to 98 years. The potential for impacts on surface water, groundwater, and substrate would increase, and would be greater than the combined impacts of Alternatives 1 and 2. Additional design features to capture and treat impacted water and waste streams would be necessary to manage mine site impacts. Overall, the magnitude of cumulative impacts on surface water, groundwater, and substrate quality from RFFAs in general would be expected to be minimal, with the exception of activities from the Pebble project buildout RFFA. Cumulative effects would increase within the mine site footprint when expanded to include	that additional information and analysis be provided in the DEIS that includes estimates of the extent, duration, and magnitude of the cumulative impacts of developing 55% of the resource over a 78-year period. For example, predicted groundwater and surface water quality concentrations would likely be different due to the presence of larger TSFs, new large waste rock facilities, and additional water management ponds and features. Some of these features would be placed in the UTC watershed. Clearly the water balance will be different. These and other factors could contribute to significant changes in groundwater and surface water quality, and we recommend that the EIS provide a detailed analysis of these cumulative impacts in order for the reader to understand the significance of the impacts.	development scenario. Description of the expanded mine scenario has been added to Section 4.1.

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			buildout development and increased fill placement.		
EPA	76	Section 4.18.6, Page 4.18-29	"The estimated area of disturbance would be greater than under Alternatives 1 and 2 combined,…"	We recommend adding values for estimated numbers of acres, wetlands, streams, etc. affected in a table for easier visualization of cumulative impacts by a reader.	The analysis of cumulative effects has been revised and expanded, including details on RFFAs including the Pebble Mine expanded development scenario. Description of the expanded mine scenario has been added to Section 4.1.
EPA	77	Section 4.18.6, Page 4.18-29	"Also, adding a diesel fuel line would increase the likelihood of hydrocarbon spills…"	To improve the analysis of potential cumulative effects, we recommend providing a detailed description of the Pebble Project buildout in Section 4.18.6, or a reference to where the description is provided. We also recommend that this section describe specifics of that scenario that are relevant to surface water and groundwater quality. For example, it is not clear how waste rock would be managed/segregated and how the waste rock facilities would be designed. It is not clear whether TSF seepage management would change, whether there would be different types of water treatment processes and outfalls and how these could change at closure. We recommend that this information be provided in the DEIS.	The analysis of cumulative effects has been revised and expanded, including details on RFFAs including the Pebble mine expanded development scenario. Description of the expanded mine scenario has been added to Section 4.1.
EPA	78	Section 4.18.6, Page 4.18-29	"Also, adding a diesel fuel line would increase the likelihood of hydrocarbon spills…"	The brief description in Chapter 4.1 does not mention the fuel line. We recommend that the DEIS explain why a mine developed based on the proposed action description would shift to utilizing a concentrate pipeline and diesel line under the expanded	Description of the expanded mine scenario has been added to Section 4.1.

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				development scenario.	