EPA Comments – Pebble Project Preliminary Draft EIS, Section 4.16 - Surface Water Hydrology

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EPA	1	4.16.2.1	The water management strategies that support the development of water management plans and the design of water management facilities for operations and closure (Knight Piésold 2018a and 2018d) were based on results of predictive mine site water balance models.	As discussed in the comment above, we recommend that additional information be provided in the EIS regarding the model approach and sensitivity analysis, so that the level of uncertainty in the model predictions are disclosed for agency decision makers and the public to understand.	Additional information regarding the calibration and validation of the watershed module is provided in Technical Appendix K3.16 (Technical Appendix to Section 3.16, Surface Water Hydrology, in Chapter 3, Affected Environment).
EPA	2	4.16.2.1	The selected precipitation values for the realizations are: …	We recommend that the DEIS describe the basis for the precipitation values used.	Text in this section has been revised, and the information to address this comment is included in Technical Appendix K3.16 (Technical Appendix to Section 3.16, Surface Water Hydrology, in Chapter 3, Affected Environment). Appendix K3.16 addresses meteorological inputs to water balance models including precipitation.
EPA	3	Table 4.16-1	Maximum pond volumes of the Pyritic and Bulk TSFs.	Even though the maximum pond volumes vary, we recommend disclosing the range of estimated pond volumes for the TSFs for agency decision makers and the public, as was done for the water management ponds.	Comment noted. Minimum pond volumes are presented for WMPs because that information is important to establish that sufficient water volume is available for process reasons. Water from the TSF ponds is not intended for process use, so the critical volume evaluation metric is maximum pond volume to ensure that water can be managed and treated effectively.
EPA	4	4.16.2.1 Water Management	The mine would be designed for zero-discharge of untreated contact water during construction, operations, and closure. Water management strategies have been developed	We recommend providing a reference to the section in the EIS where these water management strategies can be found.	The following references are applicable: Knight Piésold 2018a: Operations Water Management Plan

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			to achieve this design and maintain sufficient fresh water for ore processing and other mine site uses.		Knight Piésold 2018d: Closure Water Management Plan Both are now cited in the text and posted on the public Pebble Project EIS website document library.
EPA	5	4.16.2.1 Water Management	The average annual process water surplus during maximum operations is estimated to be 29 cubic feet per second (cfs), which would be treated and discharged throughout the year in a manner to optimize downstream fish and aquatic habitat (Knight Piésold 2018i).	We recommend providing additional information to verify that the water treatment plant has the capacity to handle the maximum flow of 29 cfs. We also recommend providing additional discussion of what is meant by the statement that the water discharge would optimize downstream habitats. In addition, we recommend that the DEIS provide a discussion of the uncertainties/level of confidence in the 29 cfs estimate. There are statements throughout the EIS in Chapter 2, and in Sections 4.16 and 4.17 about the physical habitat simulation system. Per our previous comments submitted to the Corps, we continue to recommend that more specific information is needed about how this system would work during mine operations and closure in order to evaluate the simulation system's effectiveness at achieving the stream flow augmentation goals described in this section. We have been unable to find information in the EIS that describes the system	On January 11, 2019, PLP's contractor (HDR) provided response to RFI 106 regarding Operations Phase Water Treatment Plant Engineering. The memo (HDR 2019a) provided results of evaluation and explanation that the capability of the WTPs, as designed for the 50th percentile water quality data, would be able to treat the 10th and 90th percentile input water quality. This information has been incorporated into the Section 4.18, Water and Sediment Quality. Section 4.24, Fish Values, addresses WTP discharge and optimization of downstream habitat. Discussion of WTP process rates, including uncertainties, is provided in Section 4.18, Water and Sediment Quality, and Appendix K4.18. There is no mention of "physical habitat simulation system" in Section 4.16, Surface Water Hydrology, or Section 4.17, Groundwater Hydrology. Discussion of physical habitat simulation system is in Section 4.24, Fish Values. As this comment is not applicable to this section or the physical science sections, no changes were

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				in a sufficient level of detail to support the conclusions made. We recommend that PLP supply the detailed physical habitat simulation system plan to include in the DEIS and that the plan and DEIS describe: (1) the locations where stream flows, water quality, fish, and habitat would be monitored; (2) the frequency of monitoring and parameters that would be monitored for both the receiving streams and treated water discharges; (3) the criteria that would be used to determine when treated water discharge flows need to be adjusted; (4) the possibility and frequency of adjusting treated water flow (i.e., the discharge) to adjust to changes in the receiving streams; (5) the overall robustness of this plan (e.g., examples of how physical habitat simulation systems have been successfully used elsewhere in comparison to what is proposed for the proposed action); and (6) contingency measures should it not function as planned.	made. Rather than repeat the same information multiple times in the EIS under the improved NEPA guidance, cross references are provided where appropriate in Chapter 3 and Chapter 4 sections to other related resources.
EPA	6	4.16.2.1 Water Mgmt.	Surface water quantity and distribution in the NFK and SFK watersheds would be affected during operations.	We recommend including specific information on how the surface water quantity and distribution within the watersheds are expected to be affected and the extent to which these effects would vary on a seasonal basis as	AECOM 2019b, Technical Memorandum, Streamflow Change Resulting from Development of Proposed Pebble Mine, was finalized January 11,2019 and results referenced and incorporated as needed in the Section 4.16 to address streamflow changes that would be likely to occur as a

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				well as over the life of the operation.	result of the project both for operations and post-closure.
EPA	7	4.16.2.1	Table 4.16-2 (same comment for table 4.16-3)	To more clearly describe the nature and magnitude of streamflow changes, we recommend that the DEIS provide estimates of streamflow changes for segments of stream rather than just reporting estimated changes at specific stations. For an example of this, see the approach used by EPA in Section 7.3 (Streamflow Modification) of the Bristol Bay Watershed Assessment. We recommend that separate tables be provided that show the magnitude and extent of stream flow changes without the treated water discharges so that the extent to which the treated water discharges would mitigate flow reductions is disclosed. The tables provide estimated flow reductions under average annual conditions. We recommend that additional tables and discussion be provided that disclose how the stream flow reductions would change seasonally or under low flow conditions. This will enable disclosure of the range of flow reductions that could occur at low flow with and without the treated water discharges. Also, Footnote 3 of the tables	The changes in streamflow are now addressed by reaches and are addressed on both a monthly as well as an annual basis. Knight Piésold 2018i and 2018j, address mine-affected streamflow values with and without treated water discharge, for operations (“end of mine”) and post-closure (Closure Phase 4), respectively. These reports are referenced in the narrative of Section 4.16, Surface Water Hydrology. AECOM 2019b (Technical Memorandum: Streamflow Change Resulting from Development of Proposed Pebble Mine) presents results of evaluation of streamflow changes that would likely occur during both operations and closure. This technical memo, based on data provided in Knight Piésold (2018k), is a key reference in revised Section 4.16, Surface Water Hydrology, to discuss predicted baseline and changes in streamflow as a result of the project for both operations and closure phases. Also, Section 4.24, Fish Values (reference R2 Resource Consultants 2018, HABSYN Methods) addresses the modeling for habitat prediction with or without treated water release. Notes at the end of Table 4.16-2 have been

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				refers to a Table 1 which was not provided.	revised.
EPA	8	4.16.2.1	Four phase closure plan	We recommend adding information regarding how TSF seepage will be managed during the four-phase closure plan.	Management and treatment of TSF seepage (SCP) during operations and closure is discussed in Section 4.18, Water and Sediment Quality.
EPA	9	4.16.2.2	Water withdrawal would be permitted, and would therefore meet the requirements of ADF&G and Alaska Department of Natural Resources for a water withdrawal permit.	We recommend that the DEIS summarize how PLP will demonstrate that proposed water extraction volumes and rates are within permissible limits, as per ADF&G and DNR guidance/water withdrawal permit.	Summarization of this information is beyond the scope of an EIS and would be addressed at a later permitting phase. There are no project-specific project water withdrawal permits issued to date.
EPA	10	4.16.2.3	Whether the seabed at or near the causeway would be susceptible (i.e., erodible) to propeller wash would depend on the composition of the seabed materials (e.g., sand, silt, rock), and on the management of lightering vessel operations. Establishment of suitable BMPs for vessel operations should be sufficient to minimize adverse impacts; namely, BMPs should include specifications for managing ferry speed (minimizing wakes) and engine power settings (minimizing bottom erosive stress) during approach and departure from the causeway berths.	This section discusses the erodibility of the seabed due to activities at the Port – such as propwash. The proposed Amakdedori barge berths are at -15' Mean Lower Low Water. No propwash analysis is provided to support the contention that propwash from tug, barge, and other traffic will not affect the seabed surrounding the facility. "Establishment of suitable BMPs" is generally mentioned. Without a sense of the possibility and breadth of impacts, it's difficult to know what BMPs would be needed, and whether they will be sufficient to counter scouring or other adverse effects to the seabed and resources adjacent to the structures. We recommend that the DEIS include additional information, including a propwash	Discussion of potential for propwash effects has been added. The magnitude of the incremental increase in current speed due to propwash is a function of several variables that characterize the hydrodynamics of the propeller, including its dimensions (e.g., diameter, number and pitch of blades) rotational speed, and input power (Hong et al. 2012). None of the variables related to hydrodynamics of the propellers, which would be required for propwash analysis, are available at this time. Whether the seabed at or near the causeway would be susceptible (i.e., erodible) to propeller wash would depend on the composition of the seabed materials (e.g., sand, silt, and rock), and on the management of lightering vessel operations. Establishment of suitable BMPs for vessel operations should be sufficient to minimize

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				analysis and discussion of the specific BMPs that would be utilized, to support the conclusions regarding impacts to the seabed.	adverse impacts; namely, BMPs would include specifications for managing ferry speed (minimizing wakes) and engine power settings (minimizing bottom erosive stress) during approach and departure from the causeway berths. Although ship wakes and propeller wash can contribute substantially to shoreline erosion in relatively quiescent waters, neither is expected to be an issue in Kamishak Bay. Discussion of under-keel clearance of tugs at Amakdedori port site has been added.
EPA	11	4.16.2.3	Amakdedori Port	The document currently lacks any discussion of the impacts of the causeway and jetty on nearshore sediment transport and littoral drift. Construction of the large causeway will affect sediment processes in the vicinity and we recommend that these be assessed by a coastal engineer to determine whether erosion or accretion will occur due to the causeway, and if so, how far the impact extends down the adjacent shorelines. Depending upon the direction and magnitude of accretion over time, maintenance dredging could be required. We recommend that this possibility also be assessed by a coastal engineer, and if dredging could be necessary, the DEIS should evaluate the impacts of maintenance dredging and disposal.	Discussion of potential impacts on nearshore sediment transport and littoral drift from the in-water marine structures has been expanded.

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EPA	12	4.16.2.3 Amakdedori Port	Removal of the causeway at the end of the project would cause substantial increases in suspended sediment in Kamishak Bay that would persist for days to weeks after decommissioning is completed.	We recommend that the DEIS explain how potential increases of suspended sediments will be addressed during construction activities. If this information is provided in a different section of the EIS, then please provide a reference to this section.	Potential for occurrence of suspended sediments from construction and removal of the earthen-fill causeway has been added to Section 4.16, Surface Water Hydrology. An increase in suspended sediment load would persist for a few weeks after decommissioning is completed, but would not be expected at levels substantially greater than that routinely observed in lower Cook Inlet.
EPA	13	4.16.2.5	Therefore, the intensity of the impacts to surface water resources is expected to result in changes in water quantity, likely within the limits of historic and seasonal variation.	We recommend that the DEIS summarize what changes to water quantity are expected to occur.	Summarization of this information is beyond the scope of an EIS and would be addressed at a later permitting phase. There are no project-specific project water withdrawal permits issued to date.
EPA	14	4.16.4.3	Diamond Point Port	Please see comments on Section 4.16.2.3 above; we recommend addressing the same issues here. In addition, we recommend that dredging operations be discussed. For example, please clarify whether hydraulic or clamshell dredging is proposed. The minimum size of the dewatering and placement area will be dictated by volume of material and grain-size and anticipated retention time needed for dewatering (especially in the case of hydraulic dredging). A better description of sediment characteristics will inform dewatering needs as well as dredged material utility for reuse	Comments on dredging noted; however, the type of dredging that may occur at Diamond Point port has not been determined, and no changes have been made. Information would be addressed at a later permitting phase. Per PLP 2018-RFI 063 and Chapter 2, Alternatives, of DEIS: Any rocks encountered in the channel would be moved to the side of the channel or used in the dock construction. Per PLP 2018-RFI 063 and Chapter 2, Alternatives: Dredging to a 20-foot [i.e. -20 ft re: MLLW] depth for the Diamond Point port access is recommended because the approach uses a channel for the barges and tugs to access the loading dock; whereas, at

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				in jetty construction. Chapter 2 mentions that rock may be present in the dredged material; if rock is more than just incidental, we recommend including a description of how rock will be managed during dredging and disposal. In addition, we recommend including discussion of the amount and frequency of long-term maintenance dredging based on expected direction and magnitude of littoral drift.	Amakdedori the loading dock would be open to the surrounding area. Channels are typically more prone to sedimentation requiring maintenance dredging and therefore greater under keel clearance is recommended. Amount and frequency of long-term maintenance dredging has not been determined at this time.
EPA	15	4.16.4.3	This alternative would reduce the amount of WTP water released at discharge locations at the mine site by approximately 1 to 2 percent	We recommend that the DEIS discuss the basis for the 1 to 2 percent estimate.	Under the Concentrate Pipeline Variant, the reduction in WTP released discharge would be a result of the need for water at the mine site to create the concentrate slurry and to flush the concentrate pipeline during maintenance (PLP 2018-RFI 066). Text has been added to Section 4.16, Surface Water Hydrology.
EPA	16	Table 4.16-5	NFK River – Mean annual streamflow reduction from pre-mining conditions of 7% at both NK100C and NK100A (with treated water discharge).	In addition to mean annual streamflow reductions, we recommend that the table provide estimates of streamflow reductions in the North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek during low flow conditions. We recommend that the geographic extent of steam flow reductions be disclosed by providing the estimated length of streams that would be impacted.	Revisions to Section 4.16, Surface Water Hydrology, address streamflow reductions on a monthly basis based on the 50 percent probability flow. We reference a Tech Memo (AECOM 2019b) that discusses the reduction in streamflow for two low flow conditions: 5-year low flow and 10-year low flow. The impact to streamflow by reach is discussed. The analysis covers the NFK, SFK and UTC watersheds. Estimates are provided for both operations and post-closure.

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				This comment applies to both the operations and post-closure summaries.	
EPA	17	Table 4.16-5	Transportation corridor impacts	Since impacts are predicted at stream crossings, we recommend providing the number of stream culvert and bridge crossings for each alternative for the road and pipeline components so that the impacts can be compared across the alternatives.	Figures in Chapter 2 have been added depicting all stream crossings (noting bridge or culvert) for all alternatives and variants. Fish culvert crossings are addressed in Section 4.24, Fish Values. Chapter 2, Alternatives, also describes numbers of stream crossings for each alternative. Text discussion includes description and number of crossings per alternative and variants.
EPA	18	Table 4.16-5	Impact description terminology Potential for local impacts to surface water hydrology at stream crossings. Impacts are expected to be short term, and would result in maintained surface flow system changes in water quantity that are likely within historical seasonal variation.	Rather than relying solely on descriptions such as “local” and “short term,” we recommend that additional information on geographic extent and duration be provided so that the reader understands what is meant by these terms. For example, instead of saying “local,” the DEIS could estimate how far (feet, miles?) from the transportation corridor these impacts would occur. Instead of saying “short term,” describe whether this means during construction of these features or during the entire construction and operational period (and provide estimated number of years). This same comment applies throughout the table where these terms are used.	Text discussion and a table have been edited for consistency in describing magnitude, duration, and extent of impacts, and to be as quantified as possible.
EPA	19	Table 4.16-5	Port Site alternatives	It is not clear why the port site alternatives have the same	Comparison of footprints between the port locations is provided in Chapter 2,

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			comparison	impacts given that they are in different locations and have different footprints. We recommend discussing the differences between the port site footprints and disclosing the number of streams, wetlands and other waterbodies impacted by each alternative, so that agency decision makers and the public understand the differences.	Alternatives. Impacts to wetlands and other waters are addressed in Section 4.22, Wetlands and Other Waters/Special Aquatic Sites.
EPA	20	4.16.6 Cumulative Effects	Overall, the magnitude of cumulative impacts to surface water hydrology from RFFAs in general would be expected to be minimal, with the exception of RFFA activities in the immediate mine site (e.g., Pebble Project buildout). The cumulative effects in the mine site footprint, expanded to include buildout development, would increase; but it is expected that controls would be in place to manage those impacts to prevent adverse effects on the outside environment	We recommend that the DEIS provide an analysis to support the conclusions of cumulative impacts due to the Pebble Project buildout. It is not clear what cumulative effects are being referred to in the cited text, how those cumulative effects are expected to increase, what controls would be in place, and how those controls will be monitored. We recommend that additional information and analysis be provided in the DEIS that includes estimates of the extent (miles of steams), duration, and magnitude (% reductions) of stream flow changes so that cumulative effects of the Pebble Project buildout are adequately disclosed.	The cumulative impacts narrative in Section 4.16, Surface Water Hydrology, has been expanded for the DEIS and specifically addresses the Pebble project buildout as based on the possible scenario described in PLP 2018-RFI 062. There is no defined project for the mine buildout; therefore, no quantitative impacts analysis was conducted.
EPA	21	4.16		Section 3.16.4 addresses surface water and groundwater use in the project area, however, Section 4.16 does not address potential impacts to drinking water. Multiple	The discussions of water use have been separated and reorganized in the DEIS Sections 3.16, Surface Water Hydrology, of Chapter 3, Affected Environment (includes surface water use), and Section 3.17,

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				surface water and groundwater sources, public and private, are used for domestic water supply in the project area. We recommend that Chapter 4 analyze the potential for impacts to drinking water sources. For example, we recommend discussing the proximity of project infrastructure to drinking water sources, the sources and nature of potential impacts (both quality and quantity), specific pollutants likely to impact those waters and a comparison to drinking water quality standards, whether the project impact analysis area overlaps any Drinking Water Protection Areas, and how PLP will work with the State of Alaska to ensure there are no impacts to DWPAs. We note that drinking water resources are currently addressed in varying ways in the Surface Water Hydrology, Hydrogeology, and Water and Sediment Quality sections, and recommend that it may be less confusing to the reader to consolidate these in one place as part of the Water Quality section.	Groundwater Hydrology, of Chapter 3, Affected Environment (includes groundwater use). Impacts to water quality (including drinking water sources) are addressed in Section 4.18, Water and Sediment Quality.