Proposed Pebble Project
Preliminary Draft Environmental Impact Statement
Review Comments

Reviewer:	NARF Technical Team
Date:	December 21, 2018
Chapter:	Chapter 4: Environmental Consequences
Section:	Section 4.18 Water and Sediment Quality
Document:	Sec4.18_WaterSedQual_FINAL

Comments

Section 4.18 Water and Sediment Quality. While the potential impacts listed at the beginning of this section are important mechanisms to consider, much greater risks to surface water and sediment would occur due to spills or catastrophic failures of dams or tailings impoundments due to geohazards. The potential effects of these events on surface water bodies should be described in this section.

Given the critical nature of this section in terms of evaluating the potential impacts of the proposed Pebble Project, we have attempted to evaluate this section in the same manner that we would expect to review the Draft EIS, starting with the review of the associated Appendix. Where necessary to obtain information not contained in the Appendix or main body of the EIS, we would rely on the information referenced in either the EIS or Appendix. However, in this case, the first document referenced in Appendix K4.18 WATER AND SEDIMENT QUALITY is *Knight Piésold (2018a),* which is not listed in the references provided in Section 9 of the PDEIS and could not be located on the USACE project website. As a result, the ability of the cooperating agencies to provide a substantive and meaningful review of this section is highly compromised.

Initial review of Section 4.18 found that it relies heavily on Appendix K4.18, and that Appendix K4.18 relies heavily on Knight Piésold 2018a and other references. It is also notable that the section identifies other key information such as geochemistry contained in Section 3.18 and the basis for the estimated water flows in Section 4.16. This results in the presentation of information in Section 4.18 that is very difficult to follow and comprehend. Consideration should be given to using an approach that incorporates a Conceptual Site Model (CSM) into the discussion as well as a summary of the results that is more comprehensible and focused on the outcome of the analysis in terms of impacts and proposed mitigation. <u>If a CSM is not provided, it will be necessary to develop a CSM or similar tool to support a substantive and meaningful review of this section and provide comments on the results</u>.

Appendix K4.18.1.1 Operations. According to the PDEIS, "*The mine plan module estimates the amount of water to be managed at the mine site during the operations phase of the mine under a full range of historic climate conditions. Climate variability is incorporated in the model using a*

76-year synthetic time series of monthly temperature and precipitation values to simulate the cyclical nature of the climate record. The model generated 76 unique sets of monthly water flow and storage results for each year. Three of these model runs were selected to represent dry, average, and wet climate conditions and illustrate the range of potential flows for the mine site under these varying conditions."

The Appendix and PDEIS need to address the following questions:

1. What were the historic climate conditions that were used as input to the model (i.e., location, duration, periodicity, data quality)?
2. How are the data treated? Were the data averaged or maintained as individual daily data values in the model?
3. What is the basis for the 76-year synthetic time series? How does it account for future climate variability? What do the dry, average, and wet climate conditions represent (e.g. 20-year expected high and low)? Does the model address back-to-back wet years and or back-to-back dry years?
4. What if future conditions do not mimic past conditions? What evidence is there that past climate cycles over the past 100 or more years will not be severely impacted by climate change such that they no longer are useful for predicting future climate?
5. In the same paragraph the term "relatively" is used to describe dry, average, and wet climate conditions. Are the "relative" conditions the same as those named, but not described, previously in the same paragraph?

According to the PDEIS, "*Table K4.18-2 provides the predicted water quality from various geochemical sources at the mine site that were used as inputs to the water quality model*." No discussion is provided identifying the source of the data used. For example, were the data collected from geochemical characterization tests such as Humidity Cell Tests? How were values (such as peak values and average values) selected from tests? The table notes suggest 95th percentile terms, but no discussion is provided on the results.

Section 4.18.2.1 Mine Site. <u>Surface Water Quality</u>. Effects of Dewatering Water Discharge in Construction. In all cases where water is treated and discharged into surface water, discuss the resulting water quality compared to the current water quality. This analysis should include metals, sediments, dissolved oxygen, temperature, and other important water quality features. Simply meeting APDES stormwater permit limits does not ensure that there is no degradation from current baseline conditions. This section is very general and contains many unsupported assumptions. For example, it is assumed that a modular water treatment system will successfully meet permit requirements. What would the backup plan be if the modular treatment plant fails or if there are performance issues resulting in effluent from the water treatment system that does not meet permit requirements? How frequently will monitoring be conducted during construction and operation phases?

Effects of Waste Rock/Tailings Storage and Water Management Ponds. All discussions that affect a given element of the environment should be included in one section, so that the reader does not have to page through several different sections to get a complete picture of the possible environmental impacts that may occur.

What environmental impacts could result from discharge of excess water to streams, particularly if the water chemistry or conventional qualities are different from the naturally occurring conditions?

Water Treatment during Construction. USACE needs to define "non-contact" runoff water. Roads, buildings, and other structures and surfaces at the mine site are likely to accumulate fall-out dust, and roads would collect particulate matter tracked onto the roads by vehicles. The dust and particulate matter are likely to contain greater concentrations of metals than would otherwise be found in soils. Any stormwater from the mine site or roads should be routinely tested for metals and pH, at a minimum, and stormwater should be treated if necessary prior to discharge.

Please provide more specificity on how wastewater would be "strategically discharged" to benefit downstream habitat.

Effects of Discharge Water Temperature. The first bullet item indicates that the summer average temperature does not fall within the range stated. Would any of these temperature changes cause a departure from optimal temperatures in the streams for fish or other wildlife?

Effects of Treated Water Discharge on Spatial Trends. More specific estimates for these parameters should be provided similar to those for temperature above. Otherwise, it is not possible to determine or verify that the effect on nutrient levels "*would be expected to be minimal*." A naturally nutrient-rich stream might not benefit from having additional nutrients added to its waters.

Effects during Closure/Post-Closure. Maintaining water quality in surrounding streams depends on drawing down and treating water from the pit lake in perpetuity to maintain a hydraulic sink for groundwater. This does not seem remotely realistic. At some point the lake will overflow, or the WTP will fail, financial assurances will run out, or no one will be available to continue the post-closure monitoring and maintenance work. A projection and prediction of the effect on surrounding surface waters in that eventuality should be included in the EIS to quantify and evaluate the magnitude of this potential impact.

While it may be far in the future, it is likely that Alaska Natives will still be living in this area and maintaining their traditional ways of life, as they have for millennia; therefore, it's important to identify and evaluate impacts that could occur decades into the future.

Any proposed project alternative that relies on pit lake pumping and treatment in perpetuity should be rejected, since this is a recipe for eventual disaster.

Groundwater Quality. Effects from TSF Seepage. The second paragraph of this subsection describes another project element that apparently requires pumping and treating of mine impacted water in perpetuity to avoid adverse surface water quality impacts. The history of mining sites in the North America does not suggest that such an outcome is likely, particularly with multi-national backers. Rather, the mine will probably be abandoned at some point, and the State of Alaska will inherit the risk and the responsibility for continuing damage to the once-productive salmon-bearing streams. The surrounding communities and downstream communities will experience these ongoing adverse impacts for many generations in the future.

Effects on Seeps. Figure 3.18-1 shows several seeps to the southeast of the proposed mine site footprint that discharge to surface waters. How might the water quality in these seeps be affected by impacts to groundwater at the proposed mine site?

Summary of Effects on Mine Site Groundwater Quality. If there would be impacts to groundwater quality beneath the NFK west and east drainages, wouldn't impacts to surface water quality in those drainage areas be expected? Address these potential impacts.

Effects of Erosion on Physical Substrate. If high precipitation and runoff could overwhelm BMPs, how often would this be expected to occur and what magnitude of runoff could result? Not only would particles escape, potentially increasing turbidity, but the particles would contain metals contamination affecting sediment quality.

Effects on Sediment Quality during Closure. If areas of sediment contamination remain after closure that could contribute contaminants downstream for decades. Additional testing is not significant enough mitigation unless it would lead to excavation and cleanup of these areas.

Ferry Construction and Operations. What would the stormwater treatment systems at the ferry terminals consist of?

Placement of Fill Material. Identify the stream and river crossings that have the greatest potential for impacts during construction or from vehicle traffic, identify those impacts, and describe what mitigation measures will be taken to avoid these impacts.

Sediment Contamination. These streams are currently largely pristine. Please estimate the increases in PAHs and metals concentrations in water and sediment that may occur at stream crossings due to decades of vehicle traffic, as was done for the mine site. Will vehicles be washed prior to leaving the mining site to prevent contaminants from being distributed onto the roadway, as is proposed for the Port site?

Section 4.18.5 Impacts Summary Table. Table 4.18-1. The main flaw in this PDEIS is the failure to provide any alternatives that meaningfully avoid the major impacts of the proposed mining project. Here, the main impacts are related to surface water and groundwater contamination at and surrounding the mining site, and the need to pump and treat the pit lake and other affected areas in perpetuity to prevent more substantial impacts decades in the future. This just isn't realistic, and no alternative that would avoid these impacts has been developed and proposed. An alternative that allows clean closure without the need for substantial long-term monitoring and maintenance and decades of adverse impacts to surrounding water quality should be included. Since all the alternatives in the table describe potential impacts that are generally similar to the potential impacts of Alternative 1, there are no meaningful alternatives being presented in this PDEIS.