Nondalton Tribal Council Comments – Pebble Project Preliminary Draft EIS Section 4.13 - Geology

Agency	Comment Number	Section, Paragraph, and Page #	Relevant Text/Subject	Comment	Response
Nondalton Tribal Council	1	Section 4.13.2.1	Mine Site. Removal/Relocation of Geologic Materials. Open Pit	According to the environmental impact statement (EIS), "Suitable [underline added] rocky overburden materials would be used for embankment fill, regrading purposes, and other rockfill for the project". Please refer to our comments on *Section 3.13 GEOLOGY. 3.13.4.1 Mine Site. Construction Materials*, which is copied below: Construction Materials. This subsection describes the construction materials as "suitable for use as rockfill" but does not describe what properties make them suitable. The section should be more descriptive and address what the physical and chemical characteristics of the rockfill materials are in terms of "suitability." In numerous instances construction materials used in mining projects, because they were not adequately characterized (such as for acid drainage or even nitrogen from blasting in some cases) have led to significant adverse impacts that required additional mitigation to meet regulatory requirements and prevent environmental degradation. This same comment is pertinent to other descriptions of construction materials throughout Section 3.13. These same comment is pertinent to other descriptions of construction materials throughout Section 4.13.	The discussion referenced pertains specifically to excavated rock (from quarries A, B, and C) that would be used in embankment construction. The text notes the quarry rock is typically a strong and chemically resistant rock (i.e., resistant to chemical weathering). Granodiorite is defined in the project glossary (available on the public website) as: "an intermediate composition, coarse-grained igneous rock." The "intermediate" composition (mineral content) of granodiorite is defined as greater than 20% quartz and 65% to 90% of the feldspar mineral group as plagioclase (sodium and calcium feldspars). Other similar igneous rocks may have greater potassium feldspar (orthoclase) content, such as granite. Because of the resistance to physical weathering and the chemical content of the mineralogy of granodiorite, this rock type does not tend to break apart into small pieces and chemical weathering does not produce adverse effects such as acid rock drainage. Section 4.18, Water and Sediment Quality, clarifies where monitoring would occur to assess explosives residue potentially leaching from this material. Explosives residue was considered in evaluating changes to water quality (SRK 2018a). In addition, 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 would be a significant concern. However, mitigation including testing of material sites for leachable metals and PAG rock is included in the project and described in Chapter 5, Mitigation.

Nondalton Tribal Council Comments – Pebble Project Preliminary Draft EIS Section 4.13 - Geology

Agency	Comment Number	Section, Paragraph, and Page #	Relevant Text/Subject	Comment	Response
Nondalton Tribal Council	2	Section 4.13.2.1	Mine Site. Removal/Relocation of Geologic Materials. Open Pit	Section 4.13 also describes partial pit backfilling with pyritic tailings and potentially acid generating waste rock resulting in a permanent "void" in the landscape. The PDEIS should describe this void and whether it will be filled with water resulting in a pit lake. If so, what section is addressed in? This section otherwise provides an impression that the pit will not result in a pit lake.	Section 4.17, Groundwater Hydrology addresses changes in pit lake water level after operations and maintenance of lake levels. Section 4.18, Water and Sediment Quality addresses characteristics of pit lake water. The pit will result in a pit lake with water levels maintained at a prescribed elevation.
Nondalton Tribal Council	3	Section 4.13.5	Key Issues/Impacts Summary Table. Mine Site Closure	According to the EIS, there would be long-term direct impacts from placing the pyritic TSF material in the open pit, from the partially backfilled open pit, and from the reclaimed bulk TSF. Based on this outcome the alternatives analysis should be revisited and consideration given to an alternative approach that could result in a further reduction in long-term direct impacts to the geological resources. A primary alternative for consideration to address these impacts is complete pit backfill with bulk tailings and ultimately tailings embankment materials on top, graded to near original contours, which would both reduce and nearly eliminate the open pit impacts to geology (and as a geohazard) and reduce the size of the remaining bulk TSF. This is an example of an alternative that can't be foreseen without consideration of the potential impacts through an analysis.	Impacts to geological resources addressed in Section 4.13, Geology apply only to removal and placement of materials. Impacts to water and sediment quality are addressed in Section 4.18, Water and Sediment Quality. Screening criteria for a full range of alternatives is explained in Appendix B, Alternatives Development Process. The option of filling the pit with additional bulk tails and embankment materials at closure would not provide an environmental benefit compared to the proposed project. It is acknowledged that the complete filling of the pit by pyritic tailings, bulk tailings, and embankment materials at closure could reduce the impacts to topography. However, groundwater level and groundwater quality would still need to be managed post-closure. Filling the pit with tails would make sustaining the necessary groundwater sink more difficult – such as possibly requiring a large well field to extract water to depress the groundwater surface. The option suggested in the comment will be added to Appendix B in the PFEIS and will be evaluated as per the same factors considered for other alternatives.

Nondalton Tribal Council Comments – Pebble Project Preliminary Draft EIS Section 4.13 - Geology

Agency	Comment Number	Section, Paragraph, and Page #	Relevant Text/Subject	Comment	Response
Nondalton Tribal Council	4	Section 4.13.6	Cumulative Effects	According to the EIS *"The Pebble Project buildout would require additional earthworks, such as underground mining, additional TSFs, and additional water management facilities. However, because the project would likely use much of the existing infrastructure under the proposed project, the net affected area may be less than developing mines at new greenfield sites. The magnitude of impact would thus likely be smaller."* We do not understand how describing the buildout as "smaller" than development of mines at new greenfield sites constitutes an analysis of the cumulative effects to geology. The buildout and its impacts should be described in similar detail as that of the other information provided in this section for the proposed action and alternatives.	The discussion of cumulative impacts has been revised and expanded in the DEIS.