

**Re: PLP White Paper No. 2: Development of Stable Waste Rock Piles in Alaska, Les Galbraith, Knight Piesold, Vancouver, B.C., July 20, 2012**

**Subj:** Peer Review Comments

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**Date:** October 23, 2012

This White Paper is a tutorial on waste rock piles, with virtually no Pebble-specific information on waste rock disposal.

There is no discussion on potential seepage to groundwater from Pebble waste rock, which would be one of the critical issues for the Pebble project.

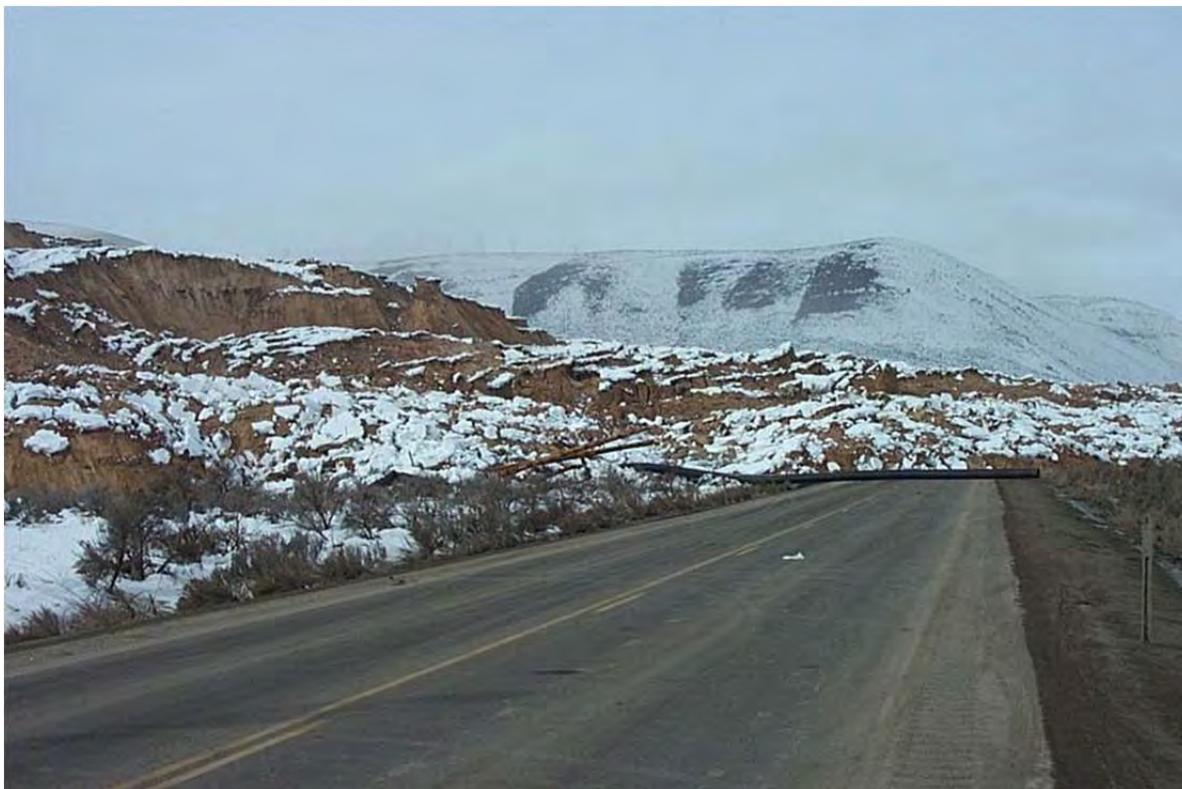
Specific Comments:

**5. Preliminary Design Considerations**

*"... larger piles with a 'High' hazard rating typically require geotechnical and hydrogeological investigations, lab testing, stability modeling, comprehensive reporting, and strict monitoring and operational controls." (White Paper No. 2, p. 4)*

The State of Alaska (ADNR or ADEC) does not have a formal classification system for mine waste rock. Furthermore, even with existing knowledge of the geochemistry and potential size of the waste rock piles at the Pebble project, there is no indication how either PLP consultants or ADNR will "classify" Pebble waste rock piles. This is significant since neither PLP nor ADNR is legally bound by any of the documents referenced in this paper.

And, despite the best efforts and intentions, waste rock piles do fail, so that must be considered as part of a risk analysis.



*Gold Quarry Mine (Nevada) Waste Rock Dump Failure – February 2005*

### **7.1. Foundation Preparation**

*“Clearing and stripping the foundations is not usually required unless it is necessary to stockpile the foundation soils for reclamation.” (White Paper No. 2, p. 5)*

At most mines waste rock is just placed on top of the existing landscape. The "foundation" soils are buried beneath the waste rock piles. There are two issues with this practice.

First, a valuable reclamation resource, soil, is being buried. At most mines soil for use in reclamation is scarce, and saving this material would aid reclamation. The primary reason soil beneath waste rock piles, and beneath tailings ponds, is not saved for reclamation is merely the cost associated with removing and saving it. Although scraping at least the “A-horizon” soil from beneath waste rock piles and tailings ponds is not prohibitively expensive, and could easily be accomplished by the same heavy equipment needed for mine construction, collecting and saving this soil is seldom done.

The second issue with placing waste rock and tailings directly on top of existing soil is that it does not create a prepared surface for the waste material that would assist in preventing the migration of contaminated water from the waste rock and tailings from entering groundwater beneath these facilities. The placement of drains and minimal compaction of the material beneath these waste facilities would greatly enhance the collection of contaminated seepage from waste rock piles and unlined tailings ponds, and assist in preventing contaminated seepage from entering groundwater.

### **7.3. Surface Water Controls (White Paper No. 2, p. 5)**

Surface water controls are discussed, but groundwater controls are not mentioned in this paper.

Groundwater control would be a major issue at the proposed Pebble project.

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