

Pre-Permitting Environmental/ Socio-Economic Data Report Series

Report Series E: Trace Elements (Sediments & Soils)

Since 2004, Pebble Partnership consultants have studied trace element levels in sediments and soils near the proposed mine site, along the proposed transportation routes, and at the proposed port site. These trace elements occur naturally in very small amounts in the natural environment and are required for many biological processes. Some examples of those being

studied include arsenic, copper, lead, molybdenum, nickel and zinc.

The Pebble Partnership has retained independent environmental consultants to conduct trace element studies, including:

- SLR Alaska, who has conducted studies in the deposit area;
- Bristol Environmental & Engineering Services who has conducted studies along the potential transportation corridors;
- HDR Alaska who has conducted studies at and near Lake Iliamna; and
- Pentec Environmental who has conducted studies near the potential port site/ marine area.

The primary objective of Pebble's trace elements study is to identify and characterize naturally occurring element levels in environmental mediums such as sediments and soils. The studies will establish background levels for the purpose of long-term monitoring of project operations.

Pebble's consultants have sampled soil and sediment for both organic and inorganic constituents. ('Sediment' is organic or inorganic matter that was suspended in water and transported by streams, eventually settling as a layer of solid particles at the bottom of a water body.)

'Organic' refers to compounds that are produced by living things, while 'inorganic' refers to compounds



Pebble mine area sediment sample collection locations

produced by non living natural processes or by human intervention.

Since program inception in 2004, teams have collected site-specific data across different habitat types and various landforms throughout the various study areas. Sampling takes place twice yearly, once at the beginning and once at the end of each field season. The Pebble field season occurs between May and September.

Work in the mine study area is focused on those portions of the South Fork Koktuli, North Fork Koktuli, Upper Talarik and Newhalen watersheds that surround the Pebble deposit. The sample sites for soil were initially chosen randomly from a grid covering the 160 square mile study area. Additional soil sample sites have been added since the program's inception to address site specific information required by the Trace Element study to complete baseline characterization. Sediment sample locations are often co-located at water quality sample sites, as well as some randomly chosen ponds.

On the transportation corridor, the sediment samples are co-located with water quality stations at potential stream crossings, while the soil samples are roughly evenly distributed along the corridor.

At Lake Iliamna, sampling sites were located near to shore in areas along the transportation corridor, and at two islands where freshwater bivalve mussels occur and at the outfall of the Upper Talarik Creek. Sediment samples were co-located with water quality samples.

Initially, four potential port sites were under consideration-however this has now been narrowed to one preferred option. Sediments have been sampled in surrounding and upland streams, creeks, rivers, ponds and seeps.

Complete copies of the Trace Elements (Sediments & Soils) data reports, released as part of the Pebble Partnership's Pre-Permitting Environmental & Socio-Economic Data Report Series, are available online at www.pebblepartnership.com.

Mine Area	Transportation Corridor
More than 200 sediment samples collected (2004-2007) from 93 locations	96 sediment samples collected (2004-2007) from 28 locations
257 soil samples collected (2007) from 133 locations	27 soil samples collected (2004-2006) from 23 locations
Port Site/Marine	Lake Iliamna
37 sediment samples collected (2004-2005) from 33 locations	17 sediment samples collected (2005-2006) from 8 locations



Pebble mine area soil sample locations

*Preliminary data only. Do not cite or quote.