



# HEAP LEACH MINERALOGY

## COARSE MINERAL CHARACTERISATION

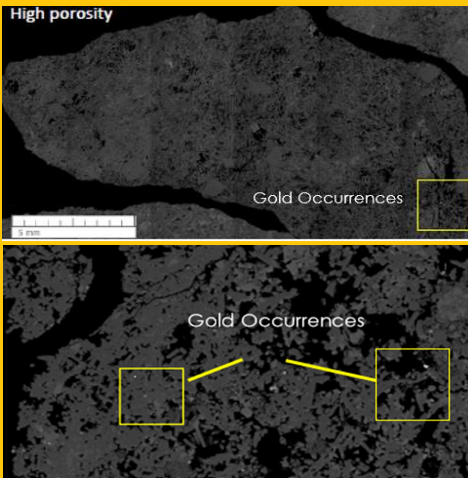
Even at very coarse sizes PMC can provide the standard package of Mineral Characterisation:

- Mineral Abundance
- Mineral Associations
- Liberation (% surface area)
- Elemental Department
- Grain Size Analysis

## WHAT CAN WE LEARN?

- Metal exposure to solution
- Are the minerals present soluble?
- Relative ratio of copper oxides and slower leaching sulphides
- Reactivity of gangue minerals that will consume lixiviant

## WHAT CAN BE SEEN AT +9.0 MM?



- High Porosity
- Gold locked in quartz – but exposed and accessible to solution

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## MINERALOGICAL CHARACTERISATION FOR HEAP LEACHING

Mineralogical investigations indicate the availability for leaching which is dependent on the lithological unit where it resides and the capacity of the lithological unit to transmit leach solutions through it. The key is porosity and permeability.

Utilizing extra-large 40mm Polished Sections offers Metal Department and Mineralogical Characterisation for heap leaching projects and operations. PMC has techniques for examination of particles up to 9.5mm (3/8").

Compared to Diagnostic or Sequential Leaching Mineralogy has less cost, requires less sample, while providing more detailed information.



Figure 1: Examples of 40-mm Polished Block sections; from left to right: +9000 fraction, +4500 fraction, +1000 fraction. Scale is in millimeters. Note the details of particles becoming available through this method.

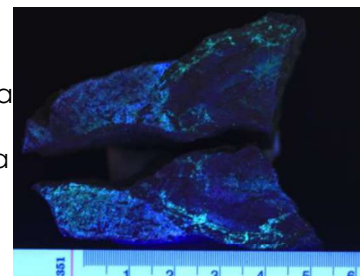
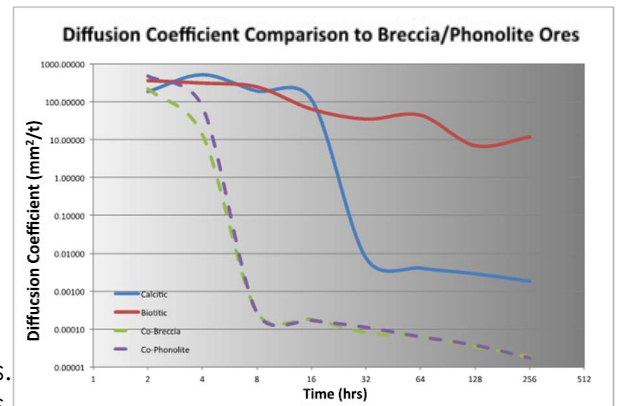
## DYE PENETRATION STUDIES

Dye penetration studies determine the fluid penetration availability of differing rock types for heap leach evaluation.

Adding this procedure with column leach tests makes a cost-effective technique for increasing the amount of information obtained.

The technique can be applied to micro-fracture production using an HPGR with various ore types and comparing recoveries to traditional crushing methods. Or to characterize ore zones for GeoMet Mapping.

As detailed here, the two different ore types of breccia were distinguished through Image Analysis and the data for the rock types segregated to give distinction in performance.



Calcitic Fragment after 16 hours in dye showing strong penetration along veins and more porous and foliated rock type of the fragment