

Bioleach



Bioleach

Bioleach is a proprietary technology developed by Activation Laboratories Ltd. (Actlabs) to dissolve remnant proteins that bacteria have left behind when they die. These proteins contain elements related to concealed mineral deposits, and they are considered to migrate upward by a variety of processes and become adsorbed on soil particles. Bioleach is designed to digest this soil component which can be analyzed by ICP/MS.

Woodjam Case Study

Thomas Bissig, Dave Heberlein and Colin Dunn performed a study for a Geoscience BC report of multiple Selective Extractions and near total extractions on B-horizon soils including the following packages:

Analytical Package Description

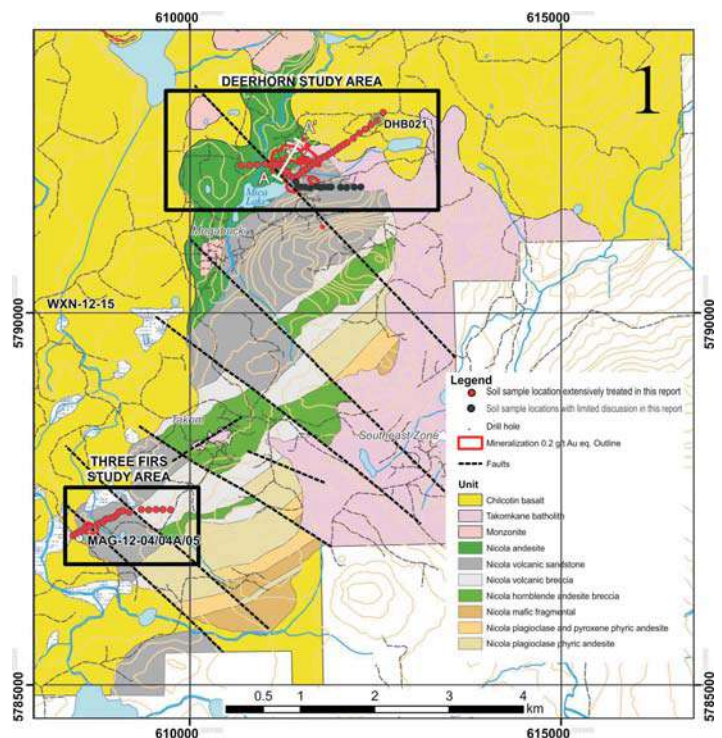
Standard Aqua Regia leach (AR)
 Ultra Trace AR high sensitivity
 4 acid strong leach (near total digestion)
 Super-trace level gold (0.01 ppb)
 Ionic leach buffered to pH 8.5
 Enzyme Selective Extraction (amorphous oxide coating) (Actlabs)
 SGH - organic compounds (Actlabs)
 OSG - sulphur compounds (Actlabs)
 Bioleach - remnant from bacteria (Actlabs)
 MMI - loosely bound surface coatings
 Ultra Trace AR on vesicle infill (high sensitivity)
 Lithium borate fusion and complete characterization

Enzyme Selective Extraction, SGH, OSG and Bioleach are all selective extractions offered by Activation Laboratories Ltd. (Actlabs) and are very weak leaches designed to capture the organic and associated inorganic signals added to various soil components. As the overburden is unrelated to mineralization, we want to preclude analysis of bulk soil itself.

General Geology

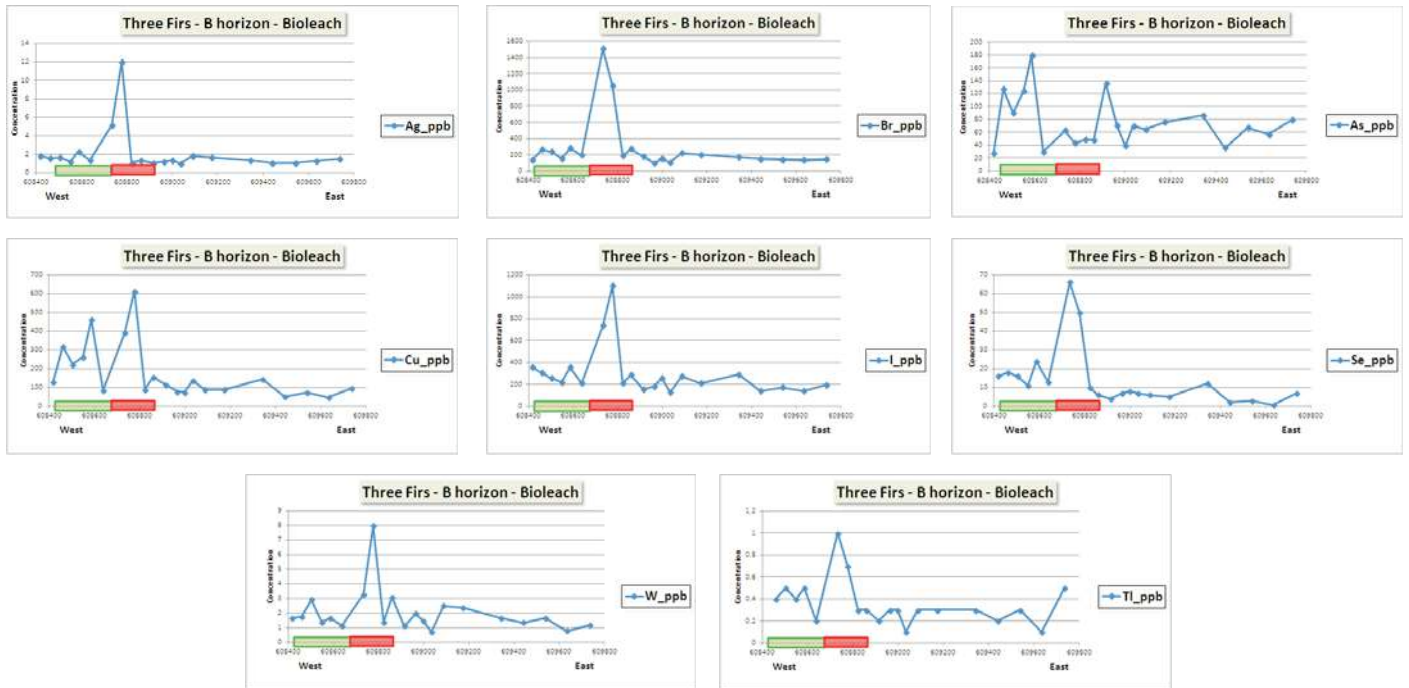
The following Figure shows the bedrock geology of the Woodjam South prospect, south-central British

Columbia (modified from Blackwell et al. 2012; Rainbow et al. 2013). Red outlines denote surface projection of the +0.2 g/t Au equivalent mineralization.



Some of the Three Firs Bioleach profiles are shown on the reverse page. This area was chosen for depiction as distribution of mineralization is apparently simpler, making for an easier interpretation of the results.

Bioleach



The above graphs show response of Bioleach to mineralization over the Three Firs study area. The green bars represent basalt cover and the red bars represent mineralization under cover. Mineralization in this area is overlain by up to 70 metres of glacial tills and up to 30 metres of cover volcanics. Several elements, including As, Se, W, Cu, Th, Br, and I show apical anomalies over mineralization. Arsenic shows a "rabbit ear" halo over the mineralization. A similar response was also obtained over the Deerhorn Study area. The reader is advised to refer to the entire publication for full details of the study.

Conclusion from Bissig, T., Heberlein, D.R., and Dunn, C. (2013): Geochemical Techniques for Detection of Blind Porphyry Copper-Gold Mineralization under Basalt Cover, Woodjam Property, South-Central British Columbia (NTS 093A/03, 06); Geoscience BC, Report 2013-17, 53 p.

"The geochemical techniques applied in this study indicate that detection of mineralization under basalt cover is possible.

Partial Leach techniques on B-Horizon soils, above all bioleach, but also [Enzyme Selective Extraction], Ionic Leach and to a lesser extent aqua regia digestions gave good contrast anomalies in soils attributable to concealed mineralization. In this context, elements that yielded compelling anomalies over mineralized areas in B-horizon soils at Deehorn, Three Firs or both include: As, Cu, Zn, Ni, Se, W, Ag, REE, Tl, In and others."

Recommendations from Bissig, T. et al.

"B-horizon soils if analysed using partial leach techniques work well for the identification of trace element anomalies related to mineralization. Partial leach techniques, above all, Bioleach and [Enzyme Selective Extraction], but also aqua regia gave the best results in the study. Aggressive 4 acid near total digestion, while of limited use for detecting anomalies related to mineralization, may work well for defining the extent of geological units. Plant geochemistry promised rapid identification of potassic alteration zones and some commodity elements under cover as well as definition of the distribution of some geological units."

Link to full report

http://www.geosciencebc.com/i/project_data/GBCReport2013-17/GBCReport2013-17_Report.pdf