Numerous analytical methods are available for analyzing samples for gold. While fire assay remains the analytical method of choice for gold evaluation, other cost-effective, multi-element alternatives exist. Assays are usually only required when a sample is known or suspected to contain higher levels of gold. Geochemical methods are for lower levels of gold, and generally provide lower detection limits.

**Geochemical Analyses**

**Soil, Rock, Water and Vegetation**

### Gold Analysis by Neutron Activation (INAA)
- Samples are irradiated in a nuclear reactor and following a 7-day decay, gamma rays are measured on a germanium detector. Analysis can be done by Code 1D Enhanced (2 ppb), Code 5B (5 ppb) or Code 1EPI (5 ppb).

### Acid Soluble Gold by ICP-MS
- Samples are digested with an aqua regia digestion and analyzed by using our Code 1A8 (0.2 ppb), Code UT-1M (0.5 ppb) or Ultratrace 1 (0.5 ppb) packages.

### BLEG - ICP-MS
- Bulk Leachable Extractable Gold is analyzed by adding a leach solution with the final analysis done by ICP-MS for Code 1A6 (0.1 - 10,000 ppb) or Code 1A6-50 (0.02 - 1,000 ppb).

### Gold Analysis in Water
- High Resolution ICP-MS (HR-ICP-MS) can be used to determine gold up to 0.1 ng/L.

### Gold in Organic Samples
- Humus samples can be analyzed by Code 2A (INAA - 1 ppb); dry vegetation can be analyzed by Code 2B (INAA - 0.1 ppb), by Code 2F (HR-ICP-MS - 0.1 ppb) or Code 2G (ICP-MS - 0.2 ppb); and ashed vegetation can be analyzed by Code 2C (INAA - 5 ppb) or by Code 2E (ICP-MS - 5 ppb).

### Heavy Mineral Concentrates
- Glacial till samples and stream sediment samples are analyzed by thermal irradiation by Code 3A (5 ppb).

**Fire Assays**

### Gold by Fire Assay
- Actlabs offers several fire assay packages with a variety of finishes and detection limits including: Fire Assay - INAA (Code 1A1 - 1-20,000 ppb), Fire Assay - AA (Code 1A2 - 5-5,000 ppb or Code 1A2B - 5-10,000 ppb), Fire Assay - ICP-OES (Code 1A2-ICP - 2-30,000 ppb), Fire Assay - ICP-MS (Code 1A2-ICPMS - 0.5-30,000 ppb), Fire Assay - Gravimetric finish (Code 1A3-30 - 0.03-10,000 g/T or Code 1A3-50 - 0.02-10,000 g/T) and Metallic Screen-Fire Assay - Gravimetric finish (Code 1A4 - 0.03 g/T).

### Control, Umpire and Bullion Assay
- Code 8A.