RAPID INDICATOR MINERAL SCAN (RIMSCAN)

SUMMARY

Indicator mineral assessment has developed into an effective method for the discovery of new mineral deposits. Conventional till and soil sampling are processed to remove heavy mineral concentrates from large samples to ensure recovery of key minerals. This method is time consuming and is generally only used for material that is coarser than 250 μm. However, a large proportion of the indicator mineral population occurs in the finer size fractions that are laborious to pick manually.

The development of High Definition Mineralogy technology has made it possible to simplify indicator mineral processing by automating the examination of heavy mineral concentrates. The finest material can now be examined for its full mineral content with rapid turnaround. This yields a great deal of information such as indicator mineral abundances, mineral mass distribution or particle sizes.

SAMPLE PREPARATION

Unlike traditional till and soil sampling procedures which typically require a 20 to 30 kg sample for processing, this method works with a smaller sample (0.5- 2 kg). A sub-sample of the sample can be submitted for geochemical analysis, while leaving sufficient material for RIMSCAN.

Each sample is wet screened at 250 μm followed by heavy liquid separation to create a heavy mineral concentrate. This is prepared into a polished section for analysis by QEMSCAN. As 60% of the indicator minerals occur in the fine fraction, this method ensures that the indicator mineral population is well sampled. Larger size fractions from standard processing protocols for kimberlite indicator minerals may also be used.

ADVANTAGES OF RIMSCAN

- Fully automated, rapid, objective identification of the full indicator mineral suite (kimberlite indicator minerals, base metal indicator minerals, gold, uranium, etc.) is possible.
- Mineral identification is no longer dependent on the skills of the observer.
- Indicator mineral recovery is quantified.
- Permanent digital record of the mineral population is kept.
- Further analysis for shape factors can provide an objective measure of transport or degree of rounding.
- This methodology can be as easily applied to soils from arid terrains as to till samples.
- Very fast turnaround with data reported in weeks.
- Small sample size reduce shipping and processing costs.
- Geochemistry can be performed on sample split.
- The polished section can be used to further analyze identified indicator minerals by other means such as electron microprobe or laser ablation ICP-MS.

DATA OUTPUT

A variety of information is obtained using this technique. The data obtained can be presented in many different ways and output can be tailored to individual project objectives.

Table 1 shows the mineral mass distribution (modal abundance) and the mean grain size determined. Tens to hundreds of thousand data points (X-Ray chemistries) are collected on each section. This allows for modal abundances of trace minerals to be determined with precision.

Grain size distribution of individual minerals can be easily obtained. Figure 1 shows the occurrence of very fine pentlandite particles. Grain size distributions may be plotted for individual minerals.

Detailed particle maps (Figure 2) of each identified mineral can also be created to show mineral abundances, relationships, grain size distribution, etc.

At a glance, these images show the variability of the mineral backgrounds from different areas.

CONTACT INFORMATION

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Sample Name	Sample 1	
Fraction	-250/+3 µm	
Particle Size	115	
Mass Size Dist. (%)	100.0	
	Mineral Mass (%)	Mean Grain Size (µm)
PGM & REE Minerals	0.01	5
Chalcopyrite	0.00	15
Pentlandite	0.00	6
Pyrite	0.00	9
Pyrrhotite	0.00	5
Other Sulphides	0.00	7
Quartz	0.27	11
Na-Plagioclase	5.17	19
Ca-Na Plagioclase	0.72	28
K-Feldspars	0.25	6
Epidote	0.04	6
Pyroxenes	29.0	33
Amphiboles	36.4	13
Chlorites	2.98	13
Biotite	1.64	6
Micas/Clays	1.52	9
Other Silicates	0.09	6
Fe-Oxides	7.43	5
Ilmenite	9.60	11
Carbonates	0.00	18
Apatite	0.12	4
Sphene	0.01	18
Other	4.69	
Total	100.0	

Table 1 – Numerical Data Output

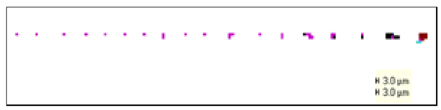

Figure 1 - Grain Size Distribution

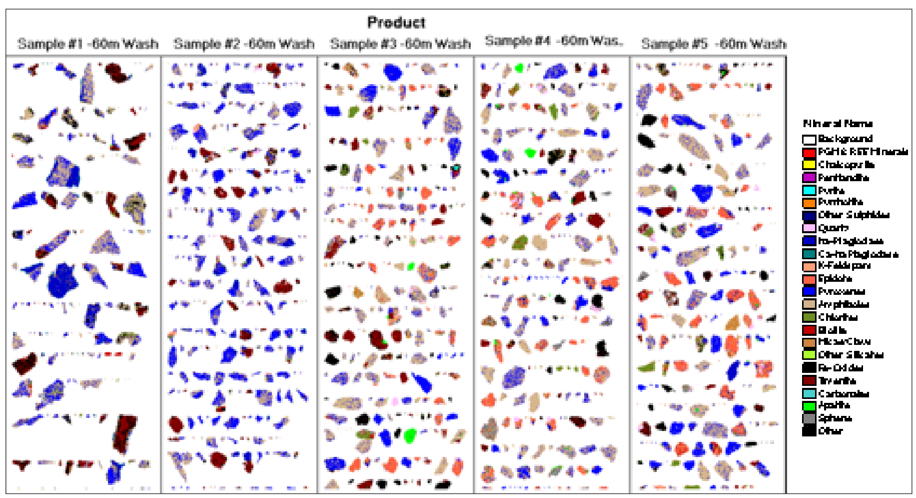

Figure 2 - Detailed Particle Map