The Importance of Deposit Specific Duplicate Sampling Protocols

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ABSTRACT

The discovery and economic extraction of ore bodies rely on accurate drilling and subsequent analysis of the sample material. A predetermined minimum number of quality control and quality assurance samples are submitted to the laboratory to assess the accuracy and precision of the results produced.

In previous years at MMG, the focus has been to examine the performance of the Certified Reference Materials (CRM's) when reviewing assay data. Duplicate sampling is also important as it is used to establish the precision of paired samples. Of the different duplicate types, the paired sample variance should decrease as the size and mass of the sample is decreased i.e. from half core samples to pulps and is expressed by Gy's Sampling Theory (Francois-Bongarcon & Gy 2001).

A review of duplicate sample data led to the development of a reference table defining the acceptable average Coefficient of Variation (CV_{avg}) values for all MMG's operations (Abzalov, 2011). This identified a problem with the sample preparation at one of our mines which prompted a review of the sample preparation at the laboratory. This highlighted the following:

- Crush duplicates failed to meet the required 85% passing 6mm.
- The impact on precision due to the failed sample preparation protocol required further investigation.

The sample nomogram was re-assessed and based on the material type the sample protocol was adjusted to reduce the potential sampling error. The impact on the overall chemical analysis was generally mitigated due to the entire sample needing to be pulverised prior to digestion. The study highlighted that before the sample protocol change, 14% of the samples might have been adversely affected.