LINKING SAMPLING and GEOSTATISTICS

On the example of the Kintyre bulk-sample project (Rio Tinto)

Whilst with Rio Tinto, H Sans worked on the Kintyre uranium project in Western Australia and assisted the project team in developing a resource estimate (1996).

This technical note is about the process used to establish the parameters to make the estimation. This involved excavating a winze, drive and crosscut and comparing the grades of bulk samples taken from the excavation with channel samples (Figure 1).

H Sans advised on the sampling procedures to use for collecting high quality channel and round samples. Sample mass requirements as per P Gy’s Sampling Theory were considered as well as style of mineralisation, equipment, QA / QC and cost. This led to optimised sample preparation protocols for both the 9kg-channel samples and 10t-rounds.

He used the variogram of the deposit to design the channel sampling scheme that would deliver a bulk sample grade estimate to the desired level of precision.

He subsequently assisted with the analysis and geostatistical interpretation of the data.

Figures 2 and 3 summarise some of the most important outcomes of this sampling project.

A close match was obtained between channel and round grades as illustrated in Figure 2. This demonstrates that the sampling procedures were both appropriate and well implemented. This also made it possible to test the applicability of the “discrete gaussian” geostatistical change-of-support model to the Kintyre style of mineralisation. Figure 3 exhibits the results of the change-of-support procedure as applied to the channel samples. It illustrates the excellent agreement found between modelled and “actual” round grades.

The bulk-sample project greatly assisted in establishing a methodology for estimating block grade distributions from sample grades at Kintyre. The quality sampling achieved critically contributed to the success of this project.

The permission given by Rio Tinto to make public this note is gratefully acknowledged.