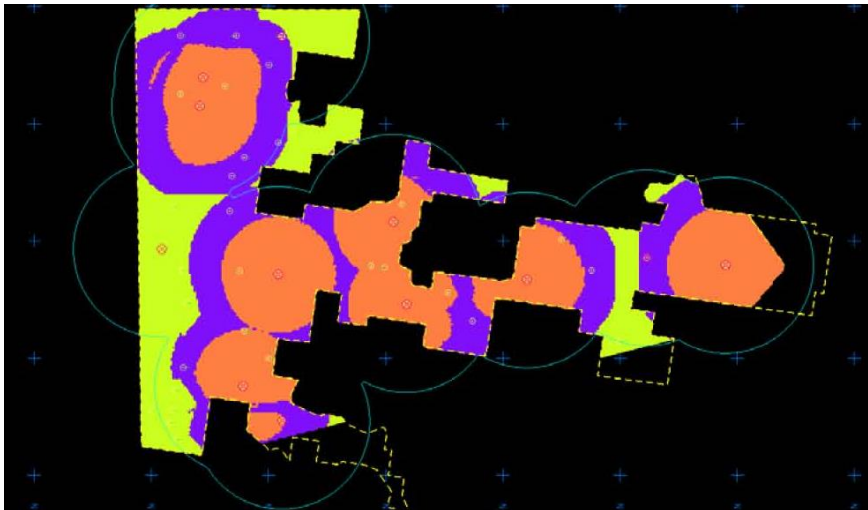


Resource Classifications: Geology, Geostatistics and Spotted Dogs

The new Australian Guidelines for coal resource estimation emphasise geology and geostatistics as a basis for classification of Mineral Resources, rather than the previous distance-based prescriptive guidelines which often led to the well-known 'spotted dog' phenomenon.

This emphasis brings coal into line with other commodities. But what techniques should be used to classify resources on a sound scientific basis?

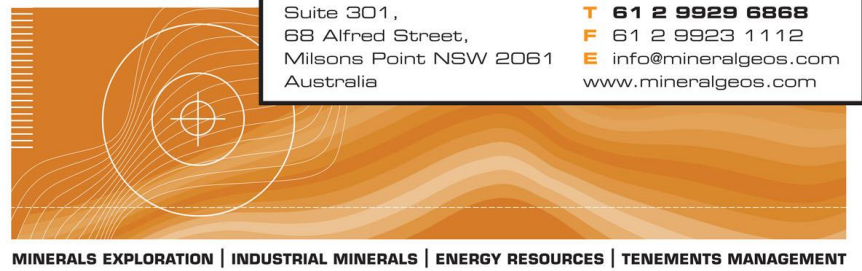


An example of the infamous spotted dog

The first step is to understand the geological and statistical domains of the deposit. The critical variables likely to impact economic value, end use or extraction technique also need to be identified. A good understanding of the data reliability and spatial variability in each domain for these critical variables is then required. This can be gained by using traditional statistical investigation and variography.

Providing the domains are valid, the number of points used to estimate the block grade and the relative location of those points may serve as a basis for resource classification; however, this method does not account for data clustering due to irregular data spacing. Where points of observation are not evenly spaced, the kriging variance for one or more critical variables is a better factor that may be used effectively for classification.

One comprehensive solution is the Data Geometry Index (A. Arik) applied as a post-process following the interpolation of coal quality. This procedure combines standard estimation parameters into a single multivariate quantity which can be used to classify resources on a per-block basis. Judicious



application results in a geologically and geostatistically robust classification that avoids many of the drawbacks of traditional geometric classification.

Exceptions arise in most classifications which require operator intervention to excise or downgrade parts of the model from the reported resources. Traditionally this requires time-consuming, manual editing of the classification polygons. Exception handling is maintained with a Data Geometry Index-based approach via a custom exclusion process within the classification macro. In practice the technique has proven considerably quicker to apply than use of geometric buffers.

Of course if the data are not reliable, the final resource and classification won't be either. We won't sign off on a resource under JORC unless we have either been able to make reasonable checks on the data, going back to as close to original records as possible, or have personal knowledge of the data collection. The nature of the checks are documented in the resource report and our opinion of the data is noted in the JORC Table 1.

If you are looking to improve your resource classification process in accordance with the latest industry guidelines, we can help. Geos Mining is able to assist with development of a suitable classification strategy; provide mentoring and training in geostatistics specific to your project requirements; or provide peer review or complete audits for resource estimates.