Minxcon Group

NEWSLETTER

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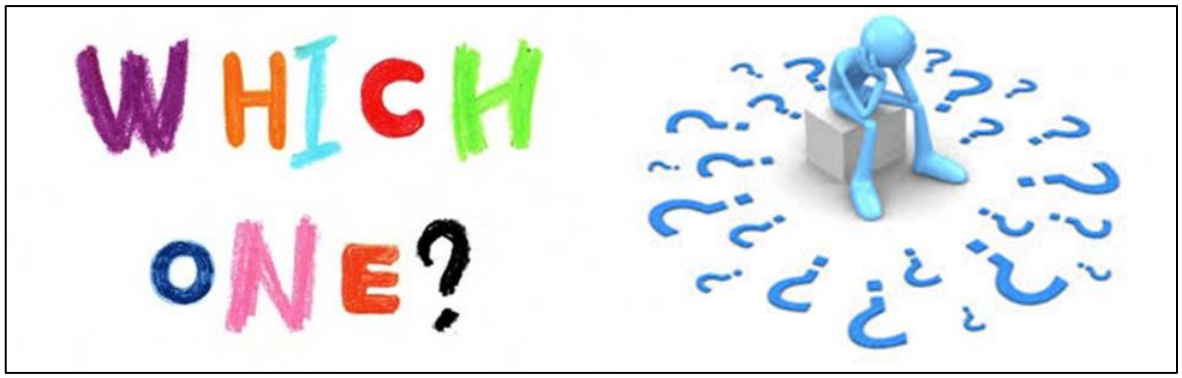
EXPLORATION | CONSULTING | PROJECTS

The Minefield of Geology/Resource Software

Mineral Resource Modelling Software: What is Your Strategy



NEWSLETTER SPOTLIGHT

◊ **Not all software solutions are appropriate for all commodities.**

◊ **High cost of software a barrier to small companies.**

◊ **Software often consists of modules - Not all software is equally good at different functions.**

◊ **Minxcon can help you tailor-make your software solution.**

Geological/Mineral Resource estimation software today has become a very diverse field with immense competition between software companies. Very often exploration and mining companies are at a complete loss as to what software to choose. It is often easier to let one individual decide and most often that person selects the software he is most acquainted with – Or a company calls in a software consultant who tries to sell their product and often (especially with people not in the know) sell software on its specific strongpoints, but forget to indicate a specific package's weak points. Also, companies often do not forge a long-term software strategy upfront that is aligned with other disciplines such as mine planning and scheduling.

So, which way should you go?

The software market has seen significant improvements over the past 25 years. Very often companies are faced with budgetary constraints. Most recognised software companies today attempt to provide a complete software solution (from drillhole logging tools through to design and scheduling software) to a potential client, with different software or software modules supplied for different functions However, not all software suites are equally suited to all aspects of a project's full value chain.

Firstly, an exploration or mining company must understand the orebody they are intending to explore and exploit. Questions to ask include:-

- Is the orebody stratiform or irregular?
- Is the orebody structurally complex?
- How dependent would a mining method and design be on orebody geometry?

When confronting the question of a software solution one should ask the following questions:-

- Is the software supplier a long-term operator or a new service provider?
- How effective is the software company's support centre in relation to queries?
- Can I conduct all the aspects I wish to cover with a software suite in Code Compliant manner for disclosure purposes if I so wish?
- How are the different software modules within a suite compatible with other modules within that specific suite?

- How compatible is the selected software solution with other software packages?
- What are the latest developments on the software front – is the historical software solution still the best?

Three significant families of geological software are available on the market and include 1) CAD based 2D to pseudo 3D systems, 2) grid modelling software which essentially conduct estimation based on algorithms in 2D and 3D, and 3) 3D space systems.

CAD based 2D to pseudo 3D geological modelling systems traditionally are used on mining operations with legacy planning software solutions. These might be useful and are often somewhat easy to operate. However, interchangeability between other software suites such as 3D space triangulation systems is often difficult. Conversely, compatibility with grid modelling software is reasonable and often easily converted. Geostatistics in these packages is often not a strong feature.

Grid modelling software is very well suited to traditional 2D, or stratiform orebodies, both for physical modelling and for resource estimation, however when it comes to the planning and scheduling realm (often within the same suite), grids need to be exported and then imported into the planning software, thus wasting valuable time and also leading to the requirement for an extra software suite. Grid modelling software also presents a significant challenge when importing into 3D space systems, often requiring a significant amount of time to achieve this. Geostatistical modelling is possible in a gridded environment but does not necessarily present functionality suitable to all estimation methods and commodities. Because some commodities have a tradition of being estimated in this type of software, it does not mean that grid software is the only solution to consider. Importing 3D space files into grid modelling systems also poses a significant challenge and requires a lot of machination to convert. For example, grid modelling systems use the actual centroid point of a cell to define the origin of a model in space, while most other 3D space systems use the bottom right hand corner of a cell block to define the block model origin. One needs to be aware of and understand these subtle differences in order to reproduce similar models in different software suites. One must always ensure that Mineral Resource models, when interchanged between softwares, share the same centroid value in order to be able to reconcile. It should be noted that the acceptable variance between models due to differences in modelling methods inherent in different software suites is only between 1% and 2% of the original estimate. Outside these limits the reproduced estimate is viewed as being non-representative.

3D space systems often offer a significant range of functionality and can cater for both stratiform and structurally complex orebodies. In addition, software providers in this space have often been in the market for a significant amount of time and have taken the trouble to provide complete to near complete, well thought out solutions from geological logging to wireframing, Mineral Resource estimation through to mine planning and scheduling. Nowadays, 3D space systems software is easily converted or imported between each other and compatibility presents fewer problems, however there still are some pitfalls that should be noted when converting models between 3D space software suites. Often block models are sub-cell split - this needs to be clearly understood in order not to over-estimate volume by treating sub-cells as true cells in a different 3D space suite. In addition, parent cell dimensions should be maintained between software suites in order to maintain estimate integrity. It is also good practice to try to ensure a single cell dimension in the vertical, or Z dimension in order to assist with conversion. Some 3D space suites make use of partial models when using a single even cell size. If not reviewed carefully, it is easy to overstate a Mineral Resource by not realising a waste volume component exists within a single model cell and must be removed for the Mineral Resource calculation.

Part of a company's strategy should consider the cost of software as well as the long-term vision with regard to the full value chain. Often utilising different software for different functions results in a significant cost due to licensing and maintenance fees. Ease of transferability and compatibility between packages should be strongly considered and the number of software providers should be optimised.

Minxcon has significant experience working in and between different software suites across a wide variety of commodities, as well as assisting exploration and mining companies in selecting software systems best suited to their requirements. Minxcon is more than adequately equipped to assist in block model and other 3D data conversions. Minxcon Mineral Resource estimation staff have more than 60 years' combined experience of working between software suites and understand the merits and potential pitfalls associated with most mining industry software. In addition, Minxcon is well suited to assist companies to make short-term to long-term decisions with regards software solution selection across all disciplines, from the exploration through to mining environment.

For more information please contact
Paul Obermeyer at paul@minxcon.co.za

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CONTACT US

Tel: +2711 958 2899

Email: reception@minxcon.co.za

Web: www.minxcon.co.za

Address: Suite 5, Coldstream Office Park, Cnr Coldstream Str & Zandvliet Roads, Little Falls, Roodepoort, SOUTH AFRICA