

Strategic Mines' proprietary tool...



A window into available optionality & value

Provides knowledge & reduces risk exposure for decision makers





How EyeMine will assist



EyeMine allows us to work with your team to develop fast, accurate and consistent analyses of DHDBs, deposit models, mine plans and production data.

Integrated data management and manipulation means we spend more time considering the issues and available options and can present them in an easily digestible fashion.



What this means for You;

EyeMine analysis provides a fast and clear depiction of the issues, threats and available options, so decision makers can make informed decisions, with a reduced risk exposure.



Most mining decisions require multi-dimensional considerations incorporating; technical merit, degree of difficulty, cost/margin impact and risk.

The best decisions are those that combine these considerations with a clear understanding of their implications.



What – EyeMine in context

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EyeMine is a proprietary analytical suite, currently in operation with Strategic Mines, using the *Tableau* platform.Mining analytics based on our collective 100+ years of relevant experience.



 Insightful analyses of DHDB, Resource / Reserve models, Mine Plans – chemical, physical, spatial & temporal.
 Flexibility allows follow-on project specific 'deep dive' queries.
 Development focus is to transition to a Server based platform – Secure but accessible for clients.

The goal today is to describe EyeMine's query suite, product outputs and applicability. These are all real projects that Strategic Mines has worked on. A live demonstration can also be arranged.



Why develop it? – Find the options, reduce the risk, get value



True value of any mine is the resource itself. The optimum development plan requires a good understanding of physical, chemical, temporal and spacial characteristics of the orebody.

Also allows for cost/ consumable/ financial evaluations.



Our first step is <u>always</u> to build our knowledge of the orebody before making any decisions. Clients require insightful information, developed quickly. But that requires asking lots of questions (ie lots of intricate work) within complicated datasets.



But nothing existed that efficiently and effectively interrogated orebody models. This lead us to develop the EyeMine orebody analytics tool.

EyeMine captures decades of our mine planning, operational and studies know-how, with the accuracy and flexibility for wide ranging application.







Captures DHBD, resource or reserve orebody data

Any parameter in the database / model



EYE ANALYTICS

Sorts, pivots and transforms...



Orebody data loaded into Tableau. Handles orebody/mining databases and models with different field structures. EyeMine sorts through data and transforms it into understandable structures. Apply pre-set general queries and specific queries. Visually represents orebody properties and characteristics. Provides unique views of your resources business. Clients are able to independently interrogate outputs.



The available Analysis Modules in EyeMine

| Orebody Analytics | Mine Engineering* | Operating Economics* | Reconciliations |
|--|--------------------------|----------------------|---------------------|
| DHDB (Expl) | Pit / cutback / schedule | Revenue profile | Fleet performance |
| Resource model | Fleet estimation | Cost profile | Production analysis |
| Reserve model | EFH & Truck hours | Margin rank pits | Mine vs GC vs Plant |
| | Bulk consumable needs | Cashflow profile | |
| Complete & in-use | Complete & in-use | Complete & in-use | Complete & in-use |
| Robust data manipulation: removes time consuming & error prone data export, transcription, pivot tables & graphing, per query Consistency and accuracy of interrogation / analysis: proactive broad based (multi-query) analysis of data/models Flexible query set to further test/probe important controls and relationships, Outputs are not-static: dynamic visual / graphical outputs allow follow-on 'ranging' or deep dive interrogation in real time Able to easily incorporate fleet/consumable/cost considerations, Database repository, with secure but accessible outputs for clients, | | | |

* EyeMine does not replace specialist mining software

EYE ANALYTICS

Architecture*

User Interface

Easy, web based user interface from computer, or tablet.

Database

Orebody database and analytics resides on secure server*. 2FA access to a client specific folder.

Analytics

Strategic Mines' analysis outputs reside on secure server. Client able to access and interrogate outputs.



CLIENT ACCESS & INTERROGATION



YOUR DEVICES

* Now transitioned onto dedicated server with 2FA security



Anytime, anywhere...

Views are easy to read and understand



Suitable for all levels of the company



Anytime, anywhere...

Views are easy to read and understand



Suitable for all levels of the company







The benefits...

EyeMine is a means to an end, allowing Strategic Mines (& Clients) to;

- Apply multiple queries, without time consuming & error prone data manipulation,
- Quickly gain a thorough understanding of the orebody, which
- Permits the best orebody development and/or mining decision(s) to be made.

It achieves this by;

- Proactively applying query sets, instead of relying on individual/reactive queries.
- Translating complex orebody datasets into incisive, easy to understand information.
- Providing outputs designed for management, engineers, geologists and metallurgists.
- Providing quick and easy access to orebody insights.
- Allowing outputs to be easily accessed & further interrogated.
- Needing only basic web skills.
- Achieving repeatable results.





* Following example slides are a combination of Strategic Mines' projects. A live demonstration is possible (via Meeting App if required)

These views of particular interest to; Resource Geologist Mining Engineer Geo-tech & Approvals Teams





parameters by section (resource or reserve), cut by Easting, or rot Don't need specialist 3D modeling packages



These views of particular interest to; EYE ANALYTICS **Resource Geologist Mining Engineer** Technical Services - Hydro Multi-parameter volume or tonnage analyses – by graph, or table... W, LG & HG tonnage by pit and development phase Total W, LG & HG tonnage by strat Waste Low Grade High Grade Most HG from Pit 2 / **Development Phase 3** Interactive pivot table ✔ (All) ✔ Waste ✔ Low Grade 🗄 🔿 Type here to search ጵ 🔨 🐷 🖬 🖬 Toggle parameters to update pivot table TMM schedule, by ore type, by pit and development phase AWT and BWT tonnages by pit, development phase wtable AWT_0 BWT AWT_3 AWT_4 AWT_5 & depth (mRL) ore Waste Low Grade High Grade Type here to search 1 O Type here to search ^ 🔹 🔛 🗰 🍕

EYE ANALYTICS

Views of model elements/parameters by depth/bench. These views are of an assay grade parameter for whole deposit (top) and by Easting (below). But could show physicals (hardness, moisture, etc)



EYE ANALYTICS

Scatter plots by elements/ore type/strat type/bench... or other parameters





Production and interrogation of multi-dimensional scatter plots easily accomplished... also able to extract data sub-sets of interest





Bubble plots are easily accomplished...



... and so are smart section views... extraction of data sub-sets possible here too



Transforms technical data into orebody knowledge



'Binning' parameters is easily accomplished...



Able to view outputs at multiple resolutions and incorporate other parameters...





G/T Curves for all ore, or by ore type (LG, HG), or strat types



... able to build interactive G/T Curves – this example incorporating a Phos cut-off





Mine Engineering & Operating Economics modules;

Once a basic mining schedule is developed, associated fleet requirements and costs can be assessed

Drilling Hours Table Drilling meters per incremental shell and bench. 0.49 446,036 0.49 3,211,457 Calculations assume a blast pattern design 1,675 0.49 3.033.043 0.49 0.49 0.49 2,966,138 958,977 1,633 1,688 1,614 1,454 1,368 1,380 0.49 825,166 0.49 0.49 3,055,345 0.49 2,921,534 Drilling costs are then able to be calculated 35,486 646,752 64,564 10,350 8,379 0.49 0.49 0.49 0.49 2,631,611 0.49 2,475,498 0.49 2,497,800 209 379,130 1.170.000 32,036 0.49 0.49 1.449.616 1.998.000 54,707 55,200 0.49 936.000 0.49 1,908,000 1,306 810.000 0.49 1.764.000 48.300 66,905 828,000 22,671 1,566,000 42,879 38,936 31,543 648 000 17,743 7,393 0.49 0.49 334,527 24,150 16,757 10,350 1,971 1,479 0.49 0.49 0.49 89,207 66,905 882,000 604 419 259 54.000 612.000 378,000 Total Machine Hours - Primary Equipment 288 000 7 886 54,000 Table Drilling Hours Table Total M 💊 👬 🗁

Application of truck haul cycle times, excavator load times and drilling meters allows calculation of total fleet hours and consumables (and hence costs)



Able to calculate;

- average cost per tonne mined expit (black line), and
- average cost per tonne of crusher feed (green line).
 With a time element in the schedule, allows cashflow calculation.
 For a multi-pit deposit, able to margin rank each pit

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These views of particular interest to; Mining Engineer Operations management Maintenance & Process Engineers



Reconciliations module; Fleet performance;

With actual fleet, plant and production data, associated performance reconciliations can be assessed



Activity (time) waterfall by Plant/Fleet type —



Plant/Fleet delays, by equipment and delay type



Production delays, by Plant/Fleet equipment and delay type







What is Tableau and do you need a software licence to access the analysis?

Tableau Software® is an interactive data visualisation package. Strategic Mines' licence allows clients' full access and interrogation of analytical outputs.

How does EyeMine relate to Tableau?

Tableau is the underlying software tool. EyeMine is the query set, specific query builder and output visualisation design, that finds the insights.

What is the required format for data upload?

Data upload is via a standard CSV file containing the unique spatial location of each block – XYZ centroid and dimensions.



Does EyeMine require a master translation code?

No. Each dataset is mapped into the EyeMine input format.

Could a time element be added to the analysis?

If a time attribute is incorporated within the dataset then it can be analysed. If not we can apply a simple sequencing algorithm. But we are not planning to develop an advance scheduling system.

Could you map a Whittle output?

Yes. For example an item like Whittle pit number could be analysed as long as it is written into the specific blocks.



Isn't EyeMine just a presentation tool?

No. Our current experience is that modelling practitioners often don't conduct basic queries on their orebody models, and/or don't provide suitable visualisations of model/schedule outputs for decision makers.

Can analyses be conducted on plunging orebodies? Yes, if modelled attributes are appropriate.

Timing to transition EyeMine onto a Secure Server? Server transition is complete and now fully commissioned with 2FA security.



Can reconciliations also be conducted?

Yes. For example blast hole/block information (hole collar position, hole depth & sample grades) vs Ex-pit production.

Can EyeMine include optionality on type and sophistication of graph outputs? Some outputs are naturally specific to a style of graph. But EyeMine outputs can be manipulated to allow specific queries to be presented in specific ways.

Can heat maps be developed to represent 3D info, ie with Z axis? Eg Attribute by XYZ, or Si/Al over time?

Yes. This is a function that is available.