okane | 25
25 Years Advancing Mine Closure Solutions

True Life of Asset Stewardship through Integrated Mine Planning

Mining companies know the value that can be extracted through Strategic Mine Planning.

By optimising your extraction sequence, keeping the mill or plant fed and realising profits early in the mine life, we can generate the highest possible peak project Net Present Value.

Why then do we not apply the same level of consideration to the entire mine life cycle? Closure remains an afterthought that too often catches us off guard.

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Key benefits of Integrated Closure Planning and the Okane service

Okane's Integrated Mine Planning and Closure service

Okane provides mining engineering services which hollistically incorporate closure in the optimization of Life of Mine (LOM) planning to maximize project value:

1. *Generate a realistic base case that matches the current Life of Mine Plan.*
2. *Identify cost and risk drivers in the Closure Plan.*
3. *Use the proven techniques of Okane Closure Services to indentify improvements in the Closure Plan that address cost, risk and ESG criteria.*
4. *Create an Integrated Life of Mine Model that incorporates Mine Closure into the LOM Plan.*
5. *Re-optimise your LOM Plan using the combined model and establish the true best plan for your mine.*

Key benefits of Integrated Closure Planning

> *Reduce closure liability.*

> *Identify the benefits of progressive reclamation.*

> *Model and assess all possible closure options, inclusive of alternative land use.*

> *Maximise product potential.*

> *Realise the value and / or liability of all assets within the mining lease, at all stages of the Mine Life Cycle.*

> ***Determine the TRUE best plan for your mine, from development to relinquishment.***

Strategic Mine Planning and Geology

Okane's Mine Planning Unit are a team of dedicated mine planners and geologists with extensive experience in Strategic Mine Planning. Services include:

> Reserve Optimization (Margin Ranking, Pseudoflow, Lerchs-Grossman).

> Life of Asset & Life of Mine Optimization.

> Life of Mine Plans.

> Dump construction optimization - As-built designs, scheduling, haulage optimization, planning for closure.

> Dump reshaping and reclamation - Detailed modelling for dozer push scenarios, cost modelling, scheduling and integration with the mining schedule.

> Autonomous and electric mining system concepts and studies.

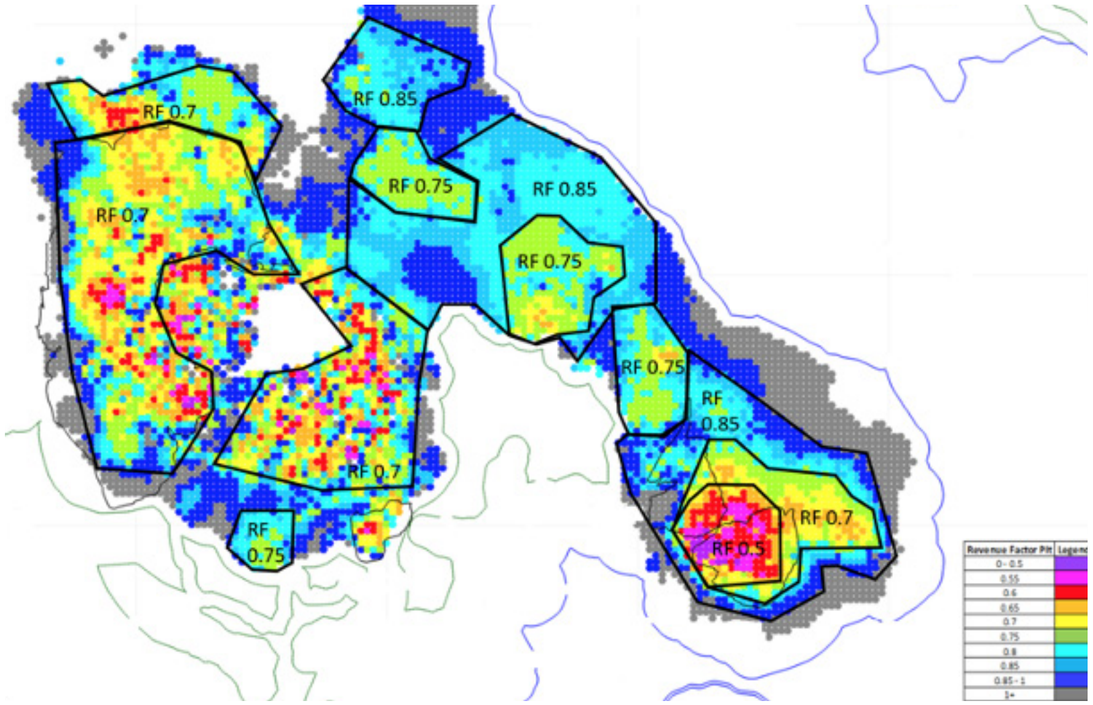
Geology Specific capabilities include:

> Resource Geology – Geological model interpretation and database integrity checking to optimize existing reserves datasets.

> Waste & tailings classifications.

> Exploration – Methodology, design and implementation of exploration activities for increased confidence in the resource and reserve.

> Risk Analysis – Geology specific residual risk, JSEA and FMEA analysis.



Tactical Planning Solutions

The Mine Planning Unit offer a range of Tactical Planning services. All team members have relevant and extensive site experience and understand the requirements of site Mine Planning:

> Short to long term design (Deswik, Vulcan, Minex) for:

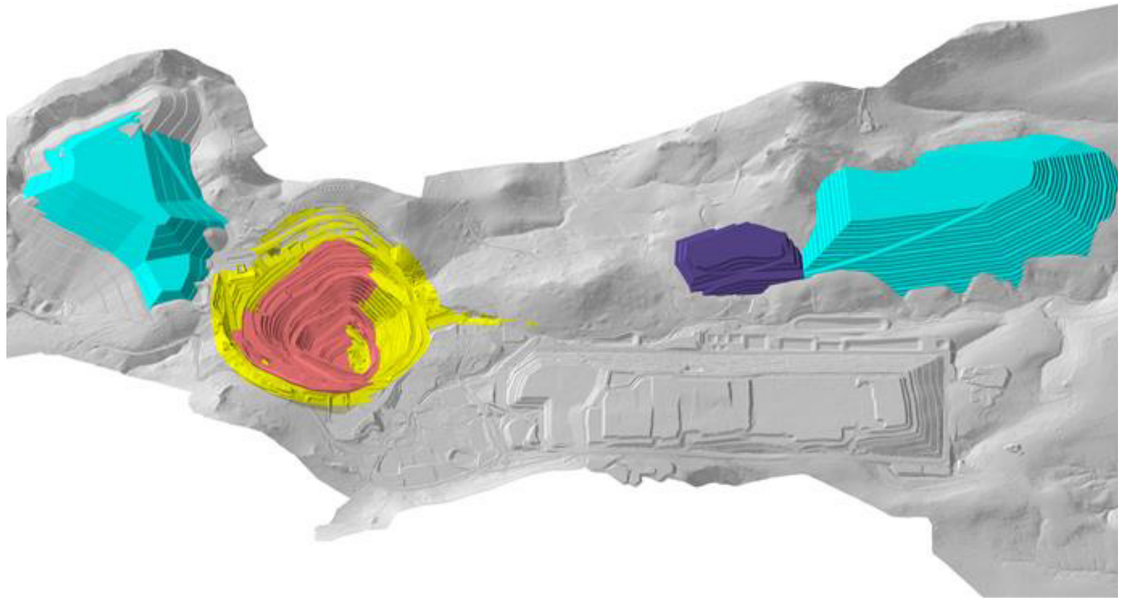
- *Truck and shovel*
- *Draglines*
- *Dozer push*
- *Alternate mining systems (highwall miners and augers)*

> Short/medium/long term Scheduling (Deswik, SPRY, XACT, XPAC, Haul Infinity, Minex and most others).

> Drill and blast design, optimization and investigation.

> Production geology – Ore quality assurance, structural mapping and interpretation.

> Geotechnical applications – Ground Control Management and structure mapping.



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Case Study – European Gold Mine operation

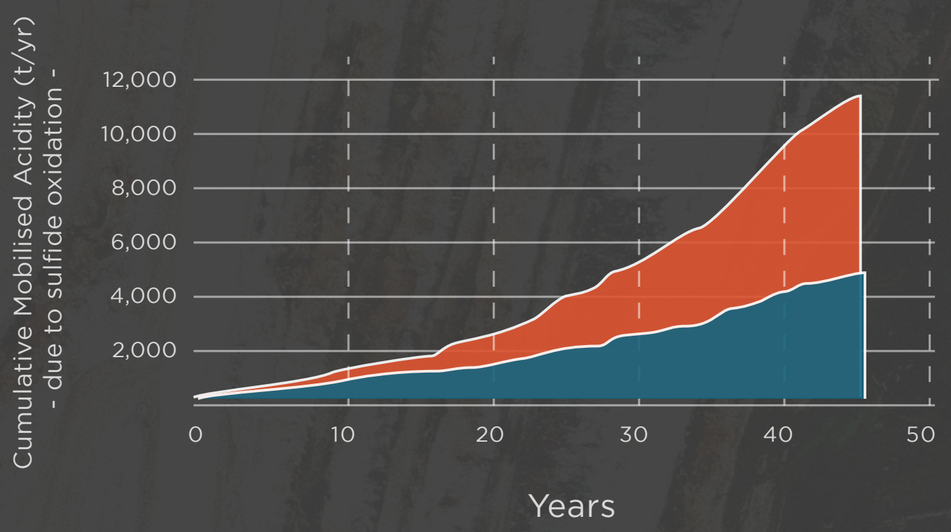
Removing closure liability through optimised waste rock dump construction.

Okane's Integrated Closure Planning service was implemented in a targeted study that considered construction methodology and final landform design of two mine waste stockpiles at a European Gold Mine. Modelling, as well as historic data captured from the operation suggested that a significant acid treatment cost could be expected as the mine progressed, with these costs potentially extending well beyond the extractive Life of Mine (LOM).

A practical solution was developed that resulted in a significantly reduced acid generating potential, through progressive closure techniques and reduced lift heights for the operating dumps. These solutions were fully modelled and costed using a best-in-class mine planning package, that can be fully integrated with the site's LOM plan. The result was a practical, executable solution and associated work plan that the mine could implement in line with their current Life of Mine strategy. The proposed construction method changes to the dump resulted in quantified increases to the mine's operating costs; however, this was outweighed by the significant reduction in long term acid treatment costs that would otherwise be realised.

The net result of this study was proof that progressive reclamation is a real, tangible and financially viable method of reducing both closure risk, cost and associated liability for operating mines.

Base Case vs
10m Lifts, Interim Covers



We're ready to help. Let's talk Integrated Mine Planning.

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