



2023

APEG MINING CONSULTING

Pursuing innovative solutions



INDEX

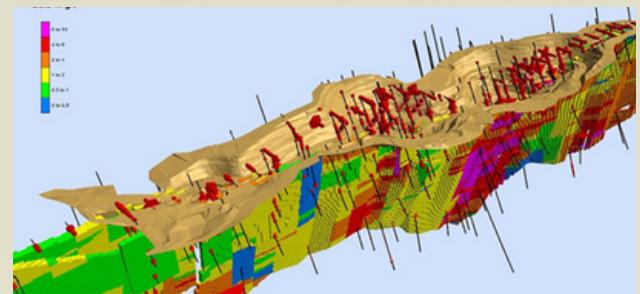
MINING SERVICES	04
<i>Resource estimation</i>	04
<i>Due Diligence</i>	04
<i>Mine Design</i>	05
<i>Strategic Scheduling</i>	05
<i>Mining Studies</i>	06
<i>Optimization</i>	06
<i>Training & Mentoring</i>	07
ABOUT US	08
OBJECTIVE	09
CLIENTS	09
CONTACT US	10

MINING SERVICES

RESOURCE ESTIMATION

APEG has an uncompromising commitment to validating source data for resource estimation.

- Our team of geologists is highly skilled and experienced from undertaking **geological interpretation**.
- We utilize **advanced software tools**, including Leapfrog, Datamine and MineSight to ensure the accuracy and reliability of our results.
- Our use of advanced **geostatistical modeling** techniques helps us to provide precise estimates.
- A **comprehensive approach** to geology ensures that we take all relevant factors into account, assessing QAQC data, reviewing domain interpretation, variographic analysis and Kriging neighborhood methodology.
- We strictly adhere to internationally recognized standards such as **JORC 2012** and **NI 43-101**.
- We work closely with our clients and offer informed advice to ensure that you have confidence in **understanding the risks** and uncertainty associated with your project resource.



DUE DILIGENCE

Mining companies find themselves needing **external review or independent support** when considering the purchase of a mining asset, entering into a joint venture or during mergers and acquisitions. Our scope of services encompasses a broad range of tasks, including critical assessments of issues or risks, desktop analysis and **comprehensive examination** of project viability.

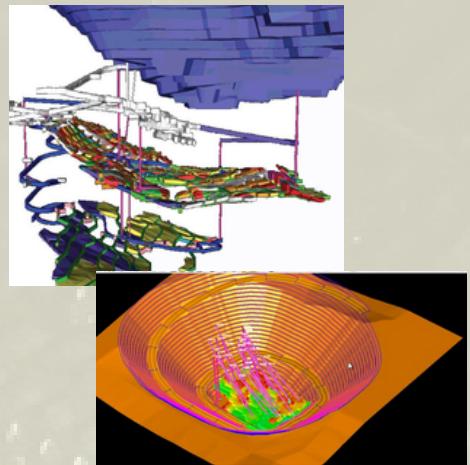
APEG can assemble an experienced team to assist in implementing:

- An **exhaustive evaluation** of all technical aspects of the project up to the present time.
- Checking the veracity of previously defined **resources**.
- Reports of the necessary work to **validate current reserves**.
- A possible enhancement of resource/reserve confidence levels by **adding additional drilling**.
- A review of the practical application of the mine design and how realistic are the **production schedules** given the physical constraints.



MINE DESIGN

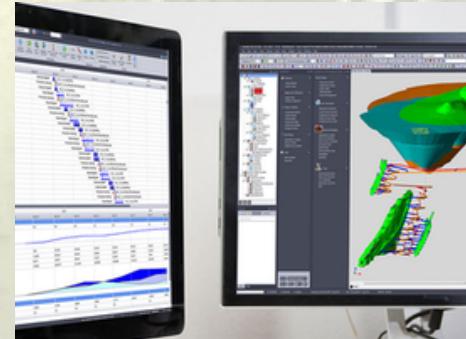
- Our APEG mining engineers possess extensive expertise in designing **Open pit and Underground** mines.
- We **collaborate closely** with our clients to select the most appropriate mining method for their orebody.
- When creating pit designs, we take into account **geotechnical factors**, strip ratios, and pit staging, based on the optimal pit shell selected during the Study's optimization phase.
- When designing underground mines, we **run stope optimizations** with different COG, MMW and stope dimensions, preparing reserve sensitivities and suitable mine designs.
- From **conceptual to final designs**, we work closely with geotechnical experts to ensure practical designs that incorporate staging, dumping strategies, stope/pillar sizes, mining sequence emphasizing communication and collaboration throughout the process.



STRATEGIC SCHEDULING

Achieving a realistic strategic schedule for underground and open pit mining operations requires a combination of **practical knowledge and expertise** in the use of advanced Strategic Mine Scheduling software.

APEG engineers are quite familiar with commercial software such as Minemax, Datamine and the full Deswik suite, in addition they have developed their own in-house **Optimizing software** for complex scheduling projects with numerous constraints.



Incorporating these tools, several different Life of mine schedules can be generated to assess: **Trade-off strategies** or **What-if scenarios** on COG optimization, production rates, development ramp ups, timing of capital expenditure, low grade stockpiling, blending strategies, fleet requirements and more.

The final objective is to evaluate **financials impacts** of specific constraints, **predetermined mining sequences**, and expected targets on the performance of the project.

MINING STUDIES

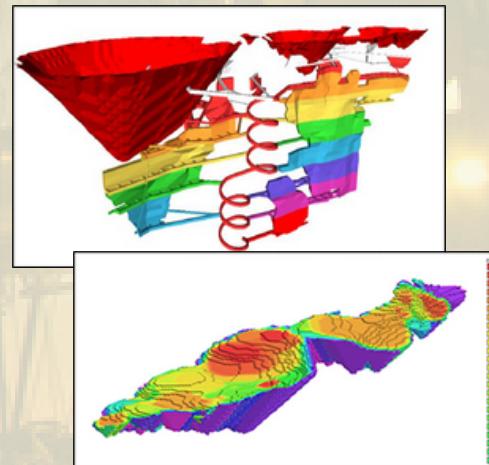
APEG mining engineers possess the expertise and experience to produce **quality studies** from Desktop/Conceptual and Scoping to Preliminary Economic Assessment (PEA), Pre-feasibility, Feasibility, Closure planning and Final landform configurations.



- Our team possess comprehensive **study management skills** and are quite experienced about various construction and operational techniques.
- Our approach is **strategic and practical**, with a focus on meeting clients' economic objectives while working within the available constraints.
- We **prioritize** identifying the most valuable actions to take while managing parameters and prevailing conditions in a clear, formalized manner.
- Collaboration is a key aspect of our approach, with APEG engineers **working closely** with clients and other specialists.
- Our consultative approach is beneficial to our clients and ensures a concerted **quality decision making**.

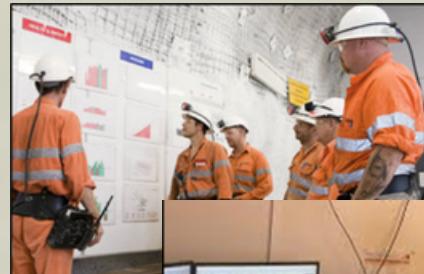
OPTIMIZATION

- APEG performs mine optimizations with **sufficient number of iterations** to define the most appropriate final UG design and cutback selection. Changing parameters to run different scenarios can be done quickly to identify the opportunity cost associated.
- Stope optimization runs can provide **understanding of potential impacts** of several constraints in the project such as variable cut-off grades, metal prices, Capex, Opex, geotechnical considerations, changes to mining methods and system sizes between others.
- **Leading edge Mine planning software** such as Whittle, Datamine-MSO, Deswik-SO and our own Optimizing software, are used in the optimizations and for all stages of the mining cycle, from exploration targeting and due diligence to detailed operating designs and for the sign-off of Ore Reserves.
- Our engineers are experienced personnel and would analyze the results to provide **clear guidelines** to the clients.



TRAINING & MENTORING

- The experienced team from APEG aims to offer clients solutions and advice to their existing **technical and operational areas** with industry proven service practices - in Australia and overseas, big departments and small, straight forward and complex.
- APEG engineers can train and **mentor your technical staff** from the efficient driving of mine planning software to the analysis and resolution of operational problems.
- We can process mapping current practices, provide **gap analysis to best practice** and delivering procedures, systems and processes to drive consistency.
- From **on-site support and coaching** to **virtual catch-ups/working sessions**, we can tailor mentoring services to specific needs to empower your people.
- Our team can close the experience gaps and provide onsite training over an extended period or an intensive **site-based program**.



APEG's engineers don't simply operate the software with a few clicks.



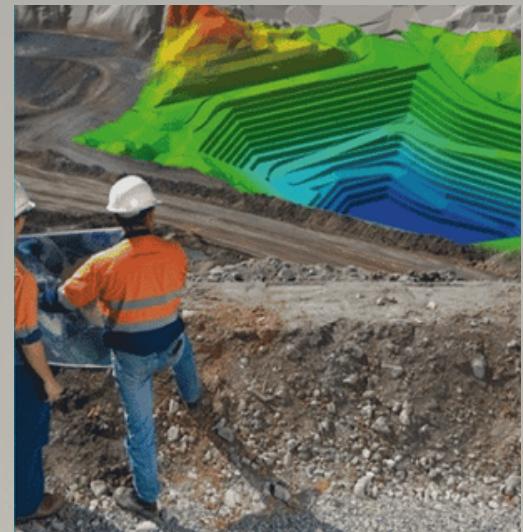
We collaborate closely with your company's key decision-makers to create a suitable approach.

ABOUT US

APEG is a team of **experienced mining experts**, who collaborate with their clients to provide practical and effective solutions to the mining industry.

We have a deep understanding of the unique challenges that mining companies face, and we provide tailored solutions that incorporate **proven practices** and the driving of **leading-edge mine planning software** to help our clients optimize their operations and reach their objectives.

Our global reach enables us to work with mining companies and projects anywhere in the world, and our team speak **English and Spanish fluently**. Whether you are a large mining company or a small mineral project, APEG is the ideal partner for delivering **practical mining solutions**. From on-site support and coaching to virtual catch-ups/working sessions don't hesitate to contact us to learn how we can assist you optimize your mining operations.



Our personnel have:

- Significant site-based experience
- Proficiency with multiple software packages
- Experience with different mining methods
- Knowledge of varying mineralization types
- Strong leadership skills
- Collaborative management styles



"We believe in building strong relationships with our clients based on trust, integrity, and transparency."

OBJECTIVE

Maximize value

Our aim is to add the maximum value to your project while working within the available constraints.

Work collaboratively

Work closely with our clients to fully comprehend their individual requirements and to create tailored solutions.

Make it possible

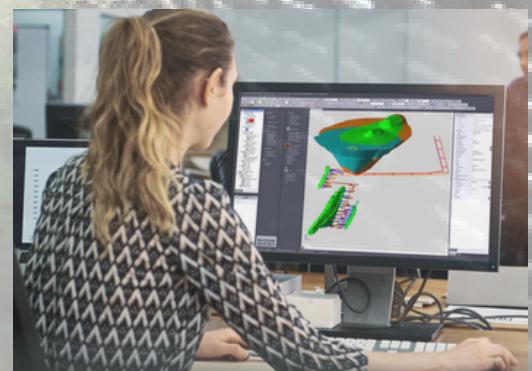
Commitment to assist our clients in achieving their objectives in the most cost-effective and sustainable manner.

Innovate and improve

Continually strive to develop new and innovative methods that can help our clients stay ahead of the value curve.

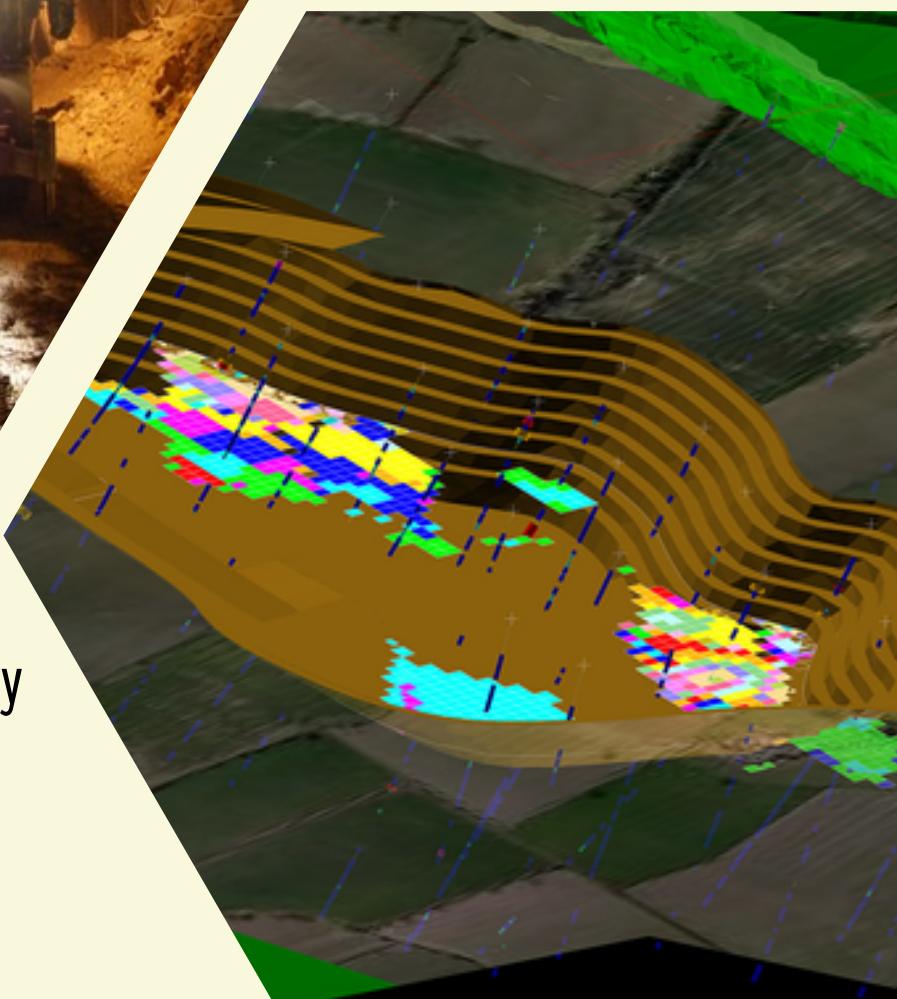
CLIENTS

- **Rio Tinto - Iron Ore division**
- **Golden Star - WASSA**
- **Polar X**
- **Dacian Gold**
- **Silver Lake Resources**
- **Oreology**
- **El Brocal**
- **BISA Ingenieros**
- **Hochschild**
- **Buenaventura**
- **Antamina**
- **Nexa Resources**



"We believe in building strong relationships with our clients based on trust, integrity, and transparency."

"Empowering the mining industry
with groundbreaking technical
solutions"



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