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23 October 2023

Geotechnical test work at Bengwenyama establishes mine design parameters in line with existing Bushveld Complex operations.

Highlights:

- **A geotechnical study by independent consulting firm OHMS has confirmed the suitability of both conventional and mechanised underground mining methods for the UG2 Reef. Parameters are in line with existing PGM production mines in the Bushveld Complex.**
- **The study is an important input to the Scoping Study, currently underway, and to the future Pre-Feasibility Study.**
- **The absence of chromite stringers in the UG2 hanging wall suggests a minimum stope width of around 1 metre. This may result in a higher reserve grade than originally anticipated as a result of potentially lower dilution levels.**
- **The study concluded that mining operations at depths greater than 50 metres underground will not impact surface infrastructure.**
- **The proposed conventional stope layout features a panel face length of 26 metres, with an expected mining extraction rate ranging from 91% down to 180m deep and reduces gradually to 78% at a depth of 540m.**
- **For a mechanized mining layout (bord and pillar at a 2m mining cut), 8x8-metre bords and 6x6-metre pillars are recommended, resulting in an expected mining extraction rate of 82% down to 240m deep that reduces gradually to 67% at a depth of 540m with pillar dimensions changing to 8x10m.**
- **DMRE acceptance of the Mining Right Application confirmed, enabling the Company to proceed with environmental expert studies and consultations toward obtaining the Mining Right.**

Southern Palladium (ASX:SPD and JSE:SDL), 'Southern Palladium' or 'the Company') is pleased to provide investors with an update on the findings of the geotechnical study conducted on the UG2 reef at the Bengwenyama Platinum Group Metal (PGM) project. This project is situated on the Eastern Limb of the world-class Bushveld Complex in South Africa.

Managing Director, Johan Odendaal said: *"We are pleased to report the findings of the geotechnical pre-feasibility study conducted by the independent consulting firm, OHMS. The study has yielded promising results, confirming the viability of both conventional and mechanised underground mining from a geotechnical perspective. The study's conclusions are reassuring. It indicates that mining operations at depths exceeding 50 metres underground do not pose a threat to surface infrastructure. Our proposed conventional stope layout is estimated to result in a mining extraction rate ranging from 91% near surface to 78%, contingent upon the depth below the surface. In the case of the mechanised mining layout (bord and pillar), we anticipate achieving an extraction rate of 82% near surface to 67%. All parameters are in line with existing Bushveld UG2 operations. It is also worth highlighting that our consultants have noted the absence of chromite stringers in the hanging wall of the UG2. Due to the absence of these stringers, which in other Bushveld operations can lead to dilution, we anticipate a potential minimum stope width of approximately 1 metre, based on an average UG2 reef width of about 70 cm."*

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"Along with the findings from our geotechnical study, Southern Palladium can confirm it has also received formal notification from the Department of Mineral Resources and Energy (DMRE) confirming the acceptance of our Mining Right application. This is an important development that provides the Company with regulatory clearance to commence in-depth environmental expert studies and consultations. These steps will pave the way for the ultimate granting of the Mining Right."

Bengwenyama Geotechnical Review

An independent geotechnical consulting group, Open House Management Solutions (OHMS), was engaged to conduct a geotechnical study for the Bengwenyama PGM project. The primary purpose of the study was to confirm the minimum allowable depth for commencing mining activities and to determine the optimal pillar layout for various mining methods.

The Bengwenyama project is designed as an underground mine with an initial focus on the UG2 Reef. The geotechnical study has established that there are two viable mining options: one involving conventional mining with a 1-metre mining width and the other employing a mechanized mining approach with a mining width of up to 2.0 metres. The choice between these methods will be influenced by factors such as financial feasibility and practicality.

UG2 Chromitite Reef Width

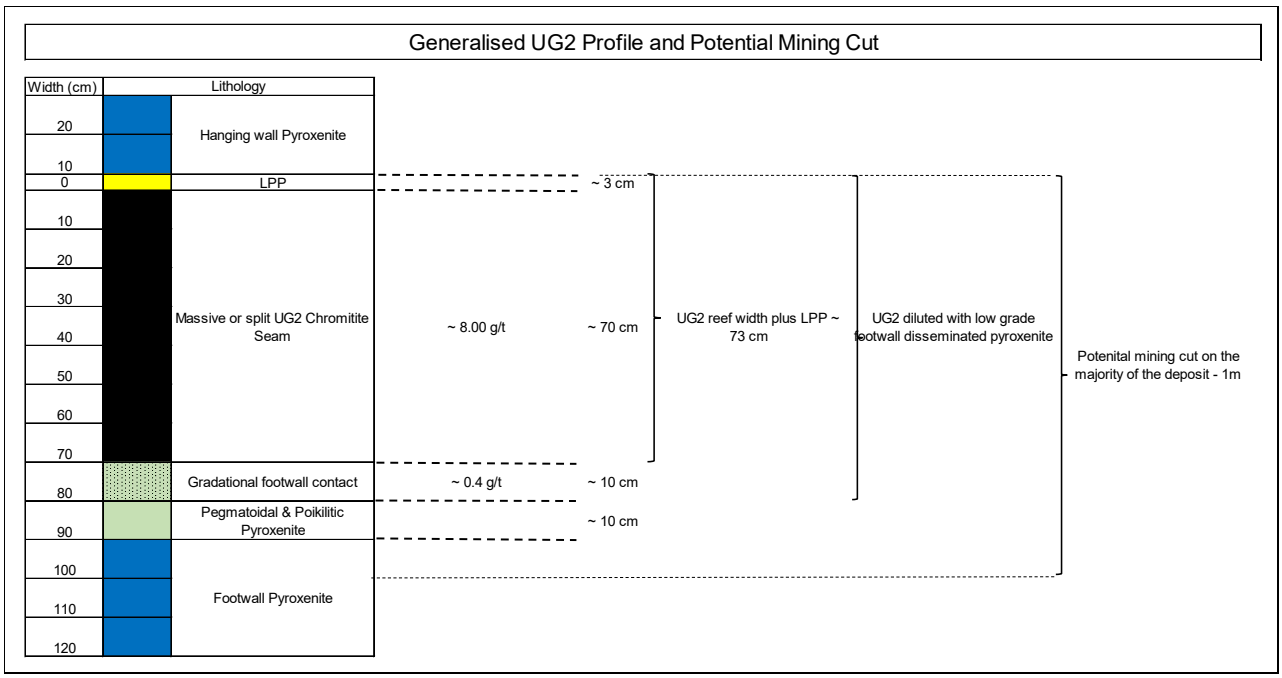
The representative UG2 drillhole intersection widths to date range from about 43cm to 136cm with an average width of 69 cm. At this stage, indications are that there are limited areas that have chromite stringers in the hanging wall of the UG2, which so far are located in a small, localised area in the northeastern part of Eerstegeluk.

The majority of the UG2 intersections have a leuconorite parting plain (LPP) as the hanging wall contact between the hanging wall pyroxenite and the UG2 reef. The footwall contact of the UG2 is either a sharp or gradational contact between the UG2 reef and the pegmatoidal or poikilitic pyroxenite.

In the case of the gradational contact there is disseminated chromite within the pyroxenite resulting in the immediate footwall being mineralised and carrying low PGM grades. It is estimated that the footwall dilution will carry a grade of between 0.3 g/t and 0.5 g/t. Since the project area has the LPP as the hanging wall contact the hanging wall dilution should be minimal and the minimum stoping width dilution will come from the low-grade footwall pyroxenite.

Indications are that the minimum stope width could be around 1m based on the average UG2 Reef width of approximately 70 cm and the absence of the chromite stringers.

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Geotechnical Information supplied to OHMS.

The following information was supplied to OHMS for this review:

- Optical televiewer ("OTV") logs of 38 exploration boreholes.
- Geological core logging sheet (structural mapping) for 67 boreholes.
- Core logs with Rock Quality Designation ("RQD") data for five partial boreholes (E072D2, E029, E029D1, E014D2, E066).
- Lithological logging sheet for five partial boreholes (E014D2, E072D2, E029, E029D1, E066).
- Four deflections for geotechnical logging, of which only three intersected the UG2.

Geotechnical test work undertaken

OHMS selected samples from the four deflections provided for laboratory strength tests. The selected samples were sent to RockLab in Pretoria, South-Africa, and were tested in accordance with the International Society for Rock Mechanics and Rock Engineering ("ISRM") procedures. The following laboratory test work has been conducted:

- Base friction angle ("BFA") tests
- Uniaxial Compressive Strength ("UCT") tests
- UCT with Young's Modulus and Poisson's ratio ("UCM")
- Triaxial Compressive Strength ("TCS") tests
- Uniaxial Indirect Tensile Strength ("UTB") tests.

The number of samples tested per rock type is tabled below.

Table 1: Sample laboratory tests conducted.

		Number of samples			
Mining Project	Rock Type	BFA	UCM	TCS	UTB
Bengwenyama	**HW Pxt**	**2**	**4**	**6**	**5**
	FW Pxt	**2**	**2**	**3**	**3**
	FW Poik Pxt		**2**	**3**	**2**
	Chrome UG2		**5**	**3**	**3**
	Chrome UG3			**3**	**2**

Note: HW Pxt – Hanging Wall Pyroxenite; FW Pxt – Foot Wall Pyroxenite; FW Poik Pxt – Foot Wall Poikilitic Pyroxenite

Based on the test work conducted above, OHMS were able to draw the following conclusion:

Geotechnical test work results

Core analysis indicates that there are no reef parallel structures present within 6m of the top of reef contact, leading to the conclusion that the UG2 should have a strong hang wall.

The results of the test work and the core logging were used to produce rock mass classifications for the various lithologies. The classification yielded similar results for the UG2, footwall and hanging wall. The Rock Mass Rating values ranged between 82 and 84 and is considered a good rating.

Geotechnical test work conclusions

A beam thickness of 6m can be considered above the stoped-out areas.

The analysis indicates that the originally planned 20m wide conventional stopes are expected to be stable, given the newly available rock mass characteristics. Moreover, the results indicates that, even with conservative input parameters, it is anticipated that a stope with a 25m span on dip and with a stope length of 100 m on strike, should be stable.

The mining extraction rate for conventional mining will range from 91% down to 180m deep and reduces gradually to 78% at a depth of 540m.

The mining extraction rate for mechanised bord and pillar mining will range from 82% down to 240m deep that reduces gradually to 67% at a depth of 540m with pillar dimensions changing to 8x10m.

Geotechnical test work recommendations.

The recommended lay-out for conventional stoping includes gully pillars of 6m x 4m with 5m holings and the panel face length of 20m. In-stope roof-bolting is recommended with a spacing at a 1.5 m x 1.5 m elongate pattern Hydra-bolts of 1.2m length is recommended for the gullies and raises, spaced 1.0 m apart to a 2-1-2 pattern. The recommended conventional development support pattern is 1.2m long, 26mm diameter hydra-bolts, tensioned and spaced 1.0 m apart to a 2-1-2 pattern.

The recommended bord and pillar mechanised layout of 8m bords and 6m pillars and 1.5 m full column grouted resin bolts spaced 1.5m on average for bords and for primary development ends.

Long high-capacity support such as 4.5 m long cable anchors is recommended at large excavation intersections, and in areas where these low-angled structures are intersected. It is recommended that it should be planned that at least 10% of the workings will require additional long anchor support.

For the assumed charge, the empirical analysis indicates that mining should not be conducted closer than 50 linear metres below surface structures.

Mining Right Application Status

On September 29, 2023, Southern Palladium officially submitted its application for a Mining Right *(refer ASX Announcement 2 October 2023)***.** On 17 October 2023, the company received notification from the Department of Mineral Resource and Energy (DMRE) that its application for the Mining Right has been accepted. This approval confirms that Southern Palladium can now initiate comprehensive expert studies and consultations which will pave the way for a decision by the Department of Mineral Resources and Energy (DMRE) by late 2024.

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This announcement has been approved for release by the Board of Southern Palladium Limited.

About Southern Palladium:

Southern Palladium Limited (ASX:SPD, JSE:SDL) is a dual-listed platinum group metal (PGM) company developing the advanced Bengwenyama PGM project, particularly rich in palladium/rhodium, in South Africa. The project is located on the Eastern Limb of the Bushveld Complex, which contains more than 70% of the world's known Platinum Group Metal (PGM) Resources.

The Company, holding a 70% stake in the project, will primarily concentrate on delivering a Pre-Feasibility study. Additionally, following the completion of a geophysical survey conducted in 2022 and the September 2023 submission of the Mining Right application, they will oversee the completion of the diamond drill programme initiated in August 2022, along with several other concurrent technical studies.

Bengwenyama presents a substantial opportunity in the global PGM market. Previous exploration efforts have already yielded a JORC 2012-compliant Inferred Mineral Resource of 25.12Moz within two ore horizons—the UG2 chromitite and Merensky Reef, achieved in 2023.

Moreover, an assessment conducted by mining industry consultants CSA Global in 2021, has identified a significant exploration target beyond the currently explored area. The Company is led by a seasoned on-ground management team, including some of South Africa's most distinguished mining industry executives.

Competent Person Statement

1. **Uwe Engelmann:** The information in this report that relates to Exploration Targets, Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr Uwe Engelmann (BSc (Zoo. & Bot.), BSc Hons (Geol.), Pr.Sci.Nat. No. 400058/08, FGSSA). Mr Engelmann is a director of Minxcon (Pty) Ltd and a member of the South African Council for Natural Scientific Professions. Minxcon provides geological consulting services to Southern Palladium Limited. Mr. Engelmann has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr. Engelmann consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. Mr Engelmann has a beneficial interest in Southern Palladium through a shareholding in Nicolas Daniel Resources Proprietary Limited.

2. **Daan van Heerden:** The scientific and technical information contained in this announcement has been reviewed, prepared, and approved by Mr Daan van Heerden (B Eng (Min.), MCom (Bus.Admin.), MMC, Pr.Eng. No. 20050318, AMMSA, FSAIMM). Mr van Heerden is a director of Minxcon (Pty) Ltd and a Registered Professional Engineer with the Engineering Council of South Africa, a Member of the Association of Mine Managers South African Council, as well as a Fellow Member of the South African Institute of Mining and Metallurgy. Mr. van Heerden has sufficient experience relevant to the styles of mineralisation and activities being undertaken to qualify as a Competent Person, as such term is defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr van Heerden has a beneficial interest in Southern Palladium through a shareholding in Nicolas Daniel Resources Proprietary Limited.

For further information, please contact:

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Appendix

1. Geotechnical core analysis

Exploration drilling and core analysis was done to determine the location of reef parallel structures in the hanging wall in relation to the top of the UG2 reef contact. The data shows that there are no reef parallel structures present within 6 m of the top of reef contact and a beam thickness of 6 m was considered.

2. Rock Mass Classification

The inherent stability of the development may be assessed empirically, using the rock mass classifications. By utilising the results of test work and the core logging conducted, the rock mass classifications for the various lithologies can be calculated. The Rock Quality Designation ("RQD"), Rock Mass Rating ("RMR") and Geological Strength Index ("GSI") are summarised as shown in table below.

Table 2: Summary of Rock Mass Classification per Lithology

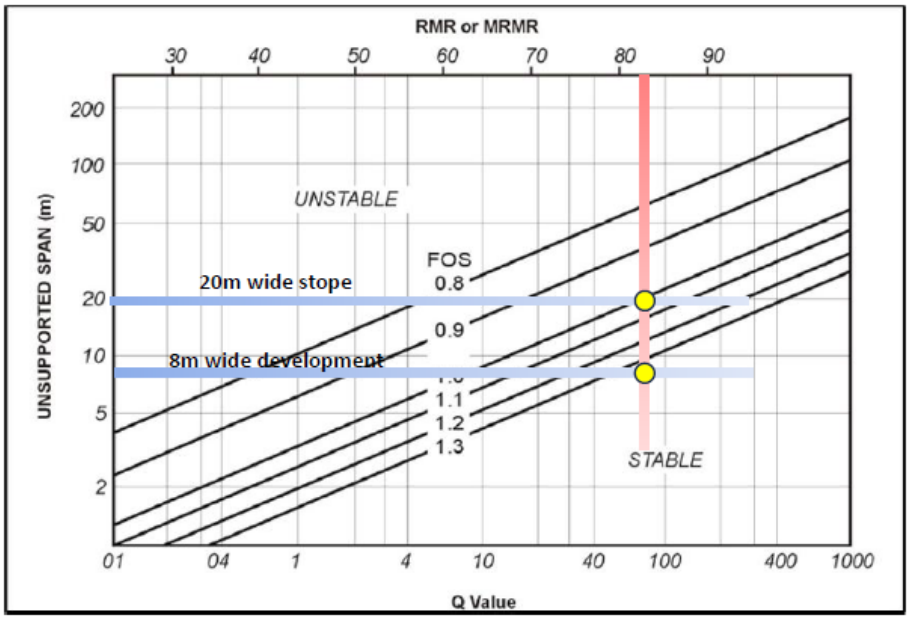
	RQD		RMR		GSI	
	Average	Std Dev	Average	Std Dev	Average	Std Dev
PYX	88.3	14.61	83.18	11.4	77.13	10.66
CR	87.48	15.03	82.87	11.74	76.71	11.05
ANM	88.37	14.66	83.29	11.27	77.14	10.52
PYXPK	86.92	21.11	82.47	18.57	76.4	17.24

PYX – Pyroxenite; CR – Chromite; ANM – Mottled Anorthosite; PYXPK – Poikilitic Pyroxenite

3. Stope span width - Stacey

The chart below, proposed by Stacey (Stacey, 2001), serves as a tool to assess the stability of non-stope underground excavations in relation to the Q-rating or Rock Mass Rating. In the context of permanent excavations, a recommended Factor of Safety (FOS) is 1.3. Caving or collapse is anticipated when factors of safety drop below 0.8. Excavations with factors of safety between 1 and 1.3 can typically maintain stability with the installation of artificial support. On the other hand, conventional stopes, considered temporary excavations, may be designed with a FOS of 0.8. The analysis indicates that the originally planned 20m wide conventional stopes are expected to be stable, given the newly available rock mass characteristics.

Figure 1: Unsupported span vs. Rock Mass Rating (Stacey, 2001)



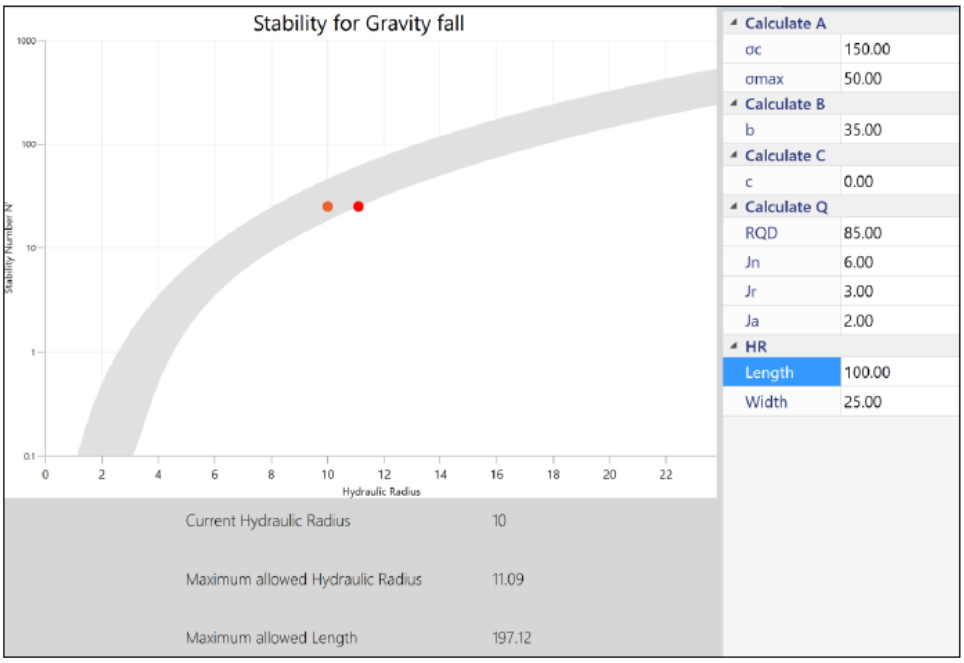
MRMR - Mining Rock Mass Rating Q value - Rock mass quality

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4. Stope span width - Matthews

A more in-depth analysis was conducted for the conventional stope spans, using the Matthews stability method. The results of that analysis below show that, even with conservative input parameters, it is anticipated that a 25 m span with a stope length of 100 m should be stable.

Figure 2: Matthews stability method for stope span stability



Recommendation:

The recommended mining layout for both Conventional and Mechanised Mining is as follows:

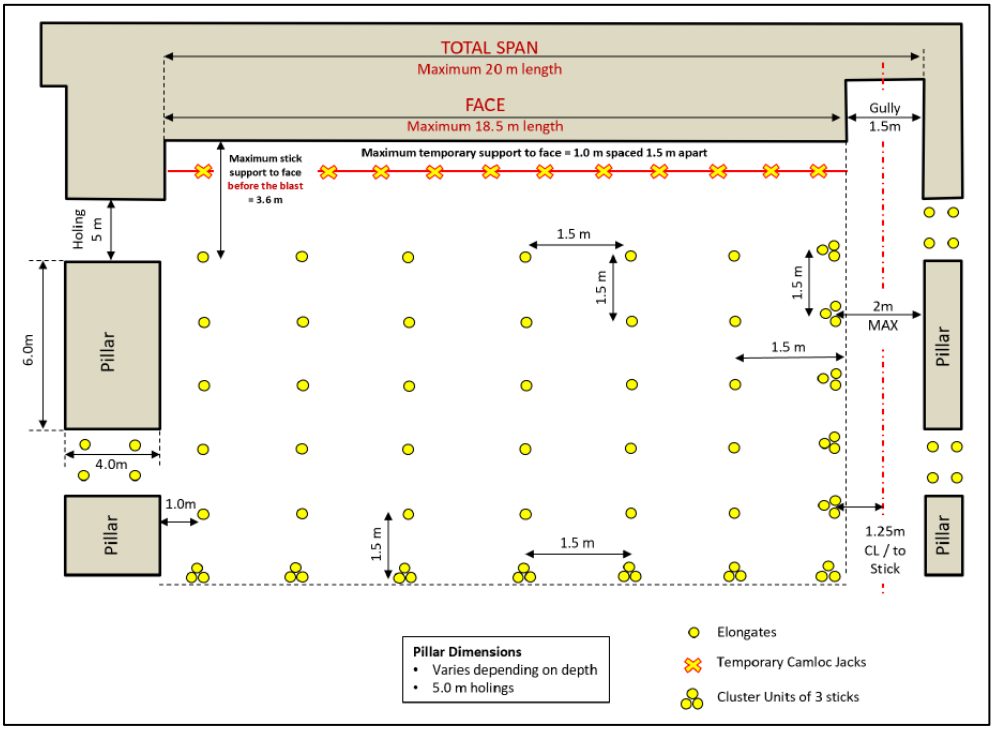
1. Conventional mining layout

The recommended layout for conventional stoping is provided in the figure below. The recommended gully pillars of 6m x 4m with 5m holings and the panel face length of 20m as indicated in the layout below results in a 91% mining extraction rate. The mining extraction rate will range from 91% down to 180m deep and reduces gradually to 78% at a depth of 540m.

In-stope roof-bolting is recommended, subject to further detailed structural key-block analysis. The recommended pattern for the in-stope bolting is 1.5 m x 1.5 m elongate pattern is recommended with 1.2 m long hydra-bolts recommended for the gullies and raises, spaced 1.0 m apart to a 2-1-2 pattern. The recommended conventional development support pattern is 1.2m long, 26mm diameter hydra-bolts, tensioned and spaced 1.0 m apart to a 2-1-2 pattern.

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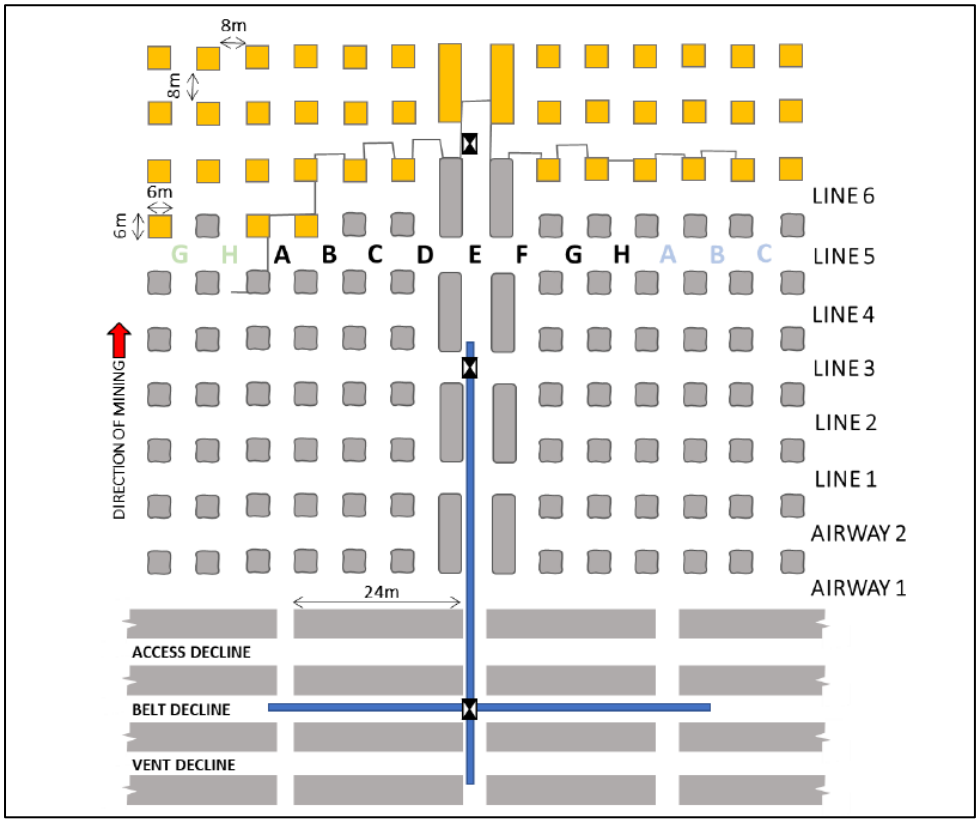
Figure 3: Conventional mining layout (1.0m stoping width)



2. Mechanised mining layout (Bord & Pillar)

The recommended layout of 8m bords and 6m pillars as indicated in the layout below results in an 82% mining extraction rate. The mining extraction rate will range from 82% down to 240m deep that reduces gradually to 67% at a depth of 540m with pillar dimensions changing to 8x10m.

Figure 4: Mechanised mining layout (Bord & Pillar)



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OHMS recommends 1.5 m full column grouted resin bolts spaced, on average, 1.5 m potential bord and pillar operations and for primary development ends.

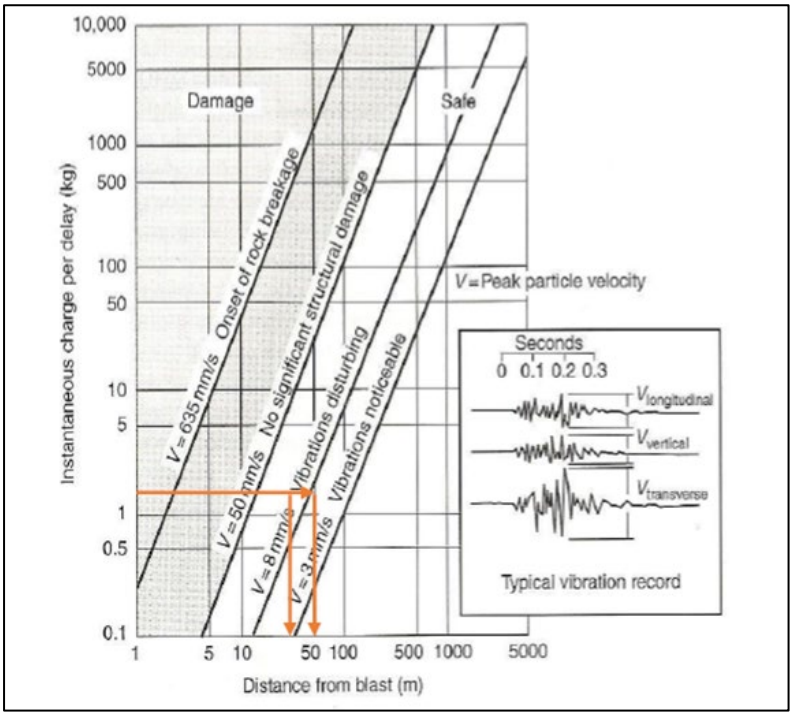
Since exploration drilling identified the occurrence of shallow dipping (<75 degrees) structures, it should be anticipated that long high-capacity support such as 4.5 m long cable anchors will also be required at large excavation intersections, and in areas where these low-angled structures are intersected. It is recommended that it should be planned that at least 10% of the workings will require additional long anchor support.

3. Minimum required mining depth below surface infrastructure.

The planned mine is close to an established community. Ground vibration is a matter of concern as it would result in damage to the existing surface structures and nuisances to the inhabitants in the vicinity of the mine. Blasting operations will result in shockwaves (body waves) travelling through the rock mass as well as surface waves that will travel along the exposed surfaces, intersected by the body waves. These waves are the most likely cause damage.

This study used the empirically devised design chart suggested in Rock Slope Engineering, authored by Wyllie and Mah.

Design chart to determine expected peak particle velocities:



The parameter most frequently used to quantify damage potential is expected peak particle velocity ("PPV") in m/s. As a result of research work carried out by the United States Bureau of Mines, limits have been set to avoid blasting damage. These limits are recognized worldwide it is generally accepted that residential buildings of sound construction can safely withstand peak particle velocities up to 50 mm/s. Privately owned property should not be subjected to PPV's of more than 12.5 mm/s, dependent on the frequency.

The figure above depicts a typical vibration control diagram. For a 2.0 m face advance, it is expected that 1.8kg of explosives will be loaded in a 36 mm diameter hole. It is further expected that 1 hole will fire at a time. It is expected that the blast will be between 40m and 50m from the surface structures. For the assumed charge, the empirical analysis indicates that mining should not be conducted closer than 50 linear metres below surface structures.

Future work requirements

The following additional work is recommended for feasibility study level.

- Orientated core drilling and geotechnical logging of the core must be conducted for rock mass characterization.
- Joint mapping must be conducted to determine rock mass properties.
- Laboratory sample strength tests must be conducted to determine rock mass strength.
- Detailed, site-specific pillar design must be conducted.
- 3-D numerical modelling of the pillars is required for optimization.
- In-panel support design must be conducted, based on the local conditions.
- Consideration must be given to in-stope bolting.

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