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Cautionary Statement

The Scoping Study referred to in this ASX release has been undertaken for the purpose of an updated initial evaluation of a potential development of the Minyari Dome Project in the Paterson Province region of Western Australia. It is a preliminary technical and economic study of the potential viability of the Minyari Dome Project. The Scoping Study outcomes, production target and forecast financial information referred to in this release are based on low accuracy level technical and economic assessments that are insufficient to support estimation of Ore Reserves. The Scoping Study has been completed to a level of accuracy of ± 35% in line with a scoping level study accuracy. While each of the modifying factors was considered and applied, there is no certainty of eventual conversion to Ore Reserves or that the production target itself will be realised. Further exploration and evaluation work and appropriate studies are required before Antipa will be in a position to estimate any Ore Reserves or to provide any assurance of an economic development case. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

Of the Mineral Resources tonnage scheduled for extraction in the Scoping Study production plan approximately 83% are classified as Indicated and 17% as Inferred during the 10+ year evaluation period. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources, or that the production target itself will be realised. Inferred Resource tonnage comprises 15% of the production schedule in the first four years of operation. Antipa confirms that the financial viability of the Minyari Dome Project is not dependent on the inclusion of Inferred Resources in the production schedule.

The Mineral Resources underpinning the production target in the Scoping Study have been prepared by a competent person in accordance with the requirements of the JORC Code (2012). The Competent Person's Statement can be found immediately prior to Appendix A of this ASX release. For full details of the Mineral Resources estimate, please refer to Antipa ASX release dated 17 September 2024. Antipa confirms that it is not aware of any new information or data that materially affects the information included in that release. All material assumptions and technical parameters underpinning the estimates in that ASX release continue to apply and have not materially changed.

This release contains a series of forward-looking statements. Generally, the words "expect", "potential", "intend", "estimate", "will" and similar expressions identify forward-looking statements. By their very nature forward-looking statements are subject to known and unknown risks and uncertainties that may cause our actual results, performance or achievements, to differ materially from those expressed or implied in any of our forward-looking statements, which are not guarantees of future performance. Statements in this release regarding Antipa's business or proposed business, which are not historical facts, are forward-looking statements that involve risks and uncertainties, such as Mineral Resource estimates, market prices of gold, capital and operating costs, changes in project parameters as plans continue to be evaluated, continued availability of capital and financing and general economic, market or business conditions, and statements that describe Antipa's future plans, objectives or goals, including words to the effect that Antipa or management expects a stated condition or result to occur. Forward-looking statements are necessarily based on estimates and assumptions that, while considered reasonable by Antipa, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies. Since forward-looking statements address future events and conditions, by their very nature, they involve inherent risks and uncertainties. Actual results in each case could differ materially from those currently anticipated in such statements. Investors are cautioned not to place undue reliance on forward-looking statements, which speak only as of the date they are made.

Antipa has concluded that it has a reasonable basis for providing these forward-looking statements and the forecast financial information included in this release. This includes a reasonable basis to expect that it will be able to fund the development of the Minyari Dome Project upon successful delivery of key development milestones and when required. The detailed reasons for these conclusions are outlined throughout this ASX release (including the Funding section of this announcement) and within the Risks and Opportunities Section of the Appendix. While Antipa considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Scoping Study, pre-production funding estimated to be approximately A$306M may be required. There is no certainty that Antipa will be able to source that amount of funding when required. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of Antipa's shares. It is also possible that Antipa could pursue other value realisation strategies such as a sale, partial sale or joint venture of the Minyari Dome Project. This could materially reduce Antipa's proportionate ownership of the Minyari Dome Project.

No Ore Reserve has been declared. This ASX release has been prepared in compliance with the current JORC Code (2012) and the ASX Listing Rules. All material assumptions, including sufficient progression of all JORC modifying factors, on which the production target and forecast financial information are based have been included in this ASX release.

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MINYARI DOME PROJECT SCOPING STUDY UPDATE

EXCEPTIONAL DEVELOPMENT POTENTIAL CONFIRMED

Antipa Minerals Limited (ASX: **AZY**) (**Antipa** or the **Company**) is pleased to announce the key outcomes of the updated Scoping Study[1] for its 100%-owned Minyari Dome Gold Project (the **Project**), located in Western Australia's Paterson Province (**Updated Scoping Study**). The Minyari Dome Project is situated just 35km from Newmont's Telfer gold-copper-silver mine and processing facility and 54km along strike from Greatland Gold-Newmont's Havieron gold-copper development project.

The Updated Scoping Study has reaffirmed the technical and financial viability of a stand-alone gold mining and processing operation at Minyari Dome. The Updated Scoping Study provides a preliminary evaluation of such a development, based on the updated September 2024 Mineral Resource Estimate (**MRE**). This MRE is expected to grow further with the ongoing Phase 2 drilling programme.

Updated Scoping Study highlights

- Initial combined open pit and underground mine schedule of **30.2 Mt at 1.5 g/t gold for 1.5 Moz gold.**
- **Over 10 years of initial processing life with a nameplate throughput of 3 Mtpa.**
- Simple, non-refractory metallurgy allows for a **standard Carbon-in-Leach (CIL) process plant, delivering an estimated gold recovery of 90%.**
- **Total initial gold production of 1.3 Moz, at an average rate of 130 koz p.a. for the first 10 years.**
- **Forecast average All-In-Sustaining-Cost (AISC) of A$1,721/oz** (equivalent to US$1,205/oz).
- **Total pre-production capital cost of A$306M**, including A$90M for pre-production mining.
- **Pre-tax NPV_7 of A$834M and 52% IRR**, assuming US$2,100/oz gold and 0.70 A$/US$ (**A$3,000/oz**).
- **Post-tax NPV_7 of A$598M and 46% IRR**, assuming US$2,100/oz gold and 0.70 A$/US$ (**A$3,000/oz**).
- **Pre-tax NPV_7 of A$1,696M and 91% IRR**, assuming US$2,800/oz gold and 0.70 A$/US$ (**A$4,000/oz**).
- **Post-tax NPV_7 of A$1,205M and 79% IRR**, assuming US$2,800/oz gold and 0.70 A$/US$ (**A$4,000/oz**).
- **Payback period of approximately 2.0 years** from the commencement of gold production.
- **Latent potential to further boost economics with resource upside and by-product opportunities.**

Key potential upside drivers

- **Further potential to extend the mine schedule and operating life from:**
  - **Targeted down-plunge extensional drilling success at Minyari ± WACA;**
  - **Drill-out of the recent discoveries at Minyari Southeast, GEO-01, GP01, and WACA East;**
  - **Further delineation and incorporation of existing satellite resources; and**
  - **New discoveries across the broader Minyari Dome Project area.**
- Additional enhancement potential **including contributions from copper and cobalt by-products.**

Next steps

- Aggressive 2024 Phase 2 drilling programme has recently commenced at Minyari Dome and will run through Q4 CY2024. Multiple further growth-focused drilling programmes are in planning for CY2025.
- Continued advancement in parallel of various technical work streams designed to further de-risk and refine the development opportunity.

[1] All Scoping Study results are approximate. Cost estimates are subject to Scoping Study level of accuracy of ± 35%.

The Updated Scoping Study is based on the September 2024 Minyari Dome MRE (JORC 2012), which comprises 47.6 million tonnes at 1.51 g/t gold, 0.18% copper, 0.43 g/t silver and 0.03% cobalt, representing 2.3 million ounces of gold, 84,000 tonnes of copper, 661,000 ounces of silver and 13,000 tonnes of cobalt (refer to Figures 12 to 14).

A summary of the Updated Scoping Study highlights is outlined below, with further detail provided in the Appendix attached to this announcement.

Antipa's Managing Director, Roger Mason, commented:

"This Updated Scoping Study has reaffirmed the technical robustness and commercial attractiveness of a stand-alone gold mining and processing operation at our flagship 100%-owned Minyari Dome Project. The study outlines a forecast mine life of over 10 years, with total gold output of 1.3 Moz, averaging 130 koz p.a. over the first ten years.

Over the past 18 months, Antipa has further unlocked the potential of Minyari Dome, delivering a 33% increase in the Mineral Resource Estimate, along with a pipeline of new high-prospectivity gold-copper targets. With significant potential for further value to be added via success with the drill bit, we remain committed to a substantial exploration programme through 2024 and 2025 across our 100%-owned Minyari Dome Project.

Strategically, Minyari Dome's location - just 35km from Newmont's (soon to be Greatland Gold's[1]), Telfer 22Mtpa processing facility – adds further optionality. While the base case remains a stand-alone operation, as outlined in this Scoping Study update, we will naturally continue to assess in parallel any potential third-party pathways that may offer greater risk-weighted value for our shareholders."

About the Updated Scoping Study

Antipa is assessing the potential for developing its 100%-owned Minyari Dome gold-silver-copper-cobalt project in the Paterson Province in north-west Western Australia. The Project is located approximately 35km from the Telfer gold-copper-silver mine and mineral processing facility, 450km east of the regional hub of Port Hedland, and 1,700km north-east of Perth (refer to Figures 1 and 16).

Minyari Dome benefits from proximity to existing material infrastructure, including:

- **Road access:** Two-lane bitumen roads from Port Hedland to Telfer Access Road turnoff, via Marble Bar, and two-lane gravel roads, including the Telfer Mine Access Road and Punmu Community Road. Site access is facilitated by well-maintained local tracks.
- **Gas pipeline:** The Telfer Mine Gas Pipeline, owned by Energy Infrastructure Investments and operated by APA Group.
- **Renewable energy development:** The planned Asian Renewable Energy Hub (AREH), which aims to generate up to 26GW of combined solar and wind power capacity, plus 1.6 million tonnes of green hydrogen production annually.
- **Port facilities:** Port Hedland port, a major bulk import and export facility.
- **Airports:** Access via Port Hedland International Airport and Newmont / Greatland Gold's Telfer Airport.

[1] Refer to Greatland Gold plc AIM release dated 14 October 2024, "Acquisition of Havieron & Telfer – Update".

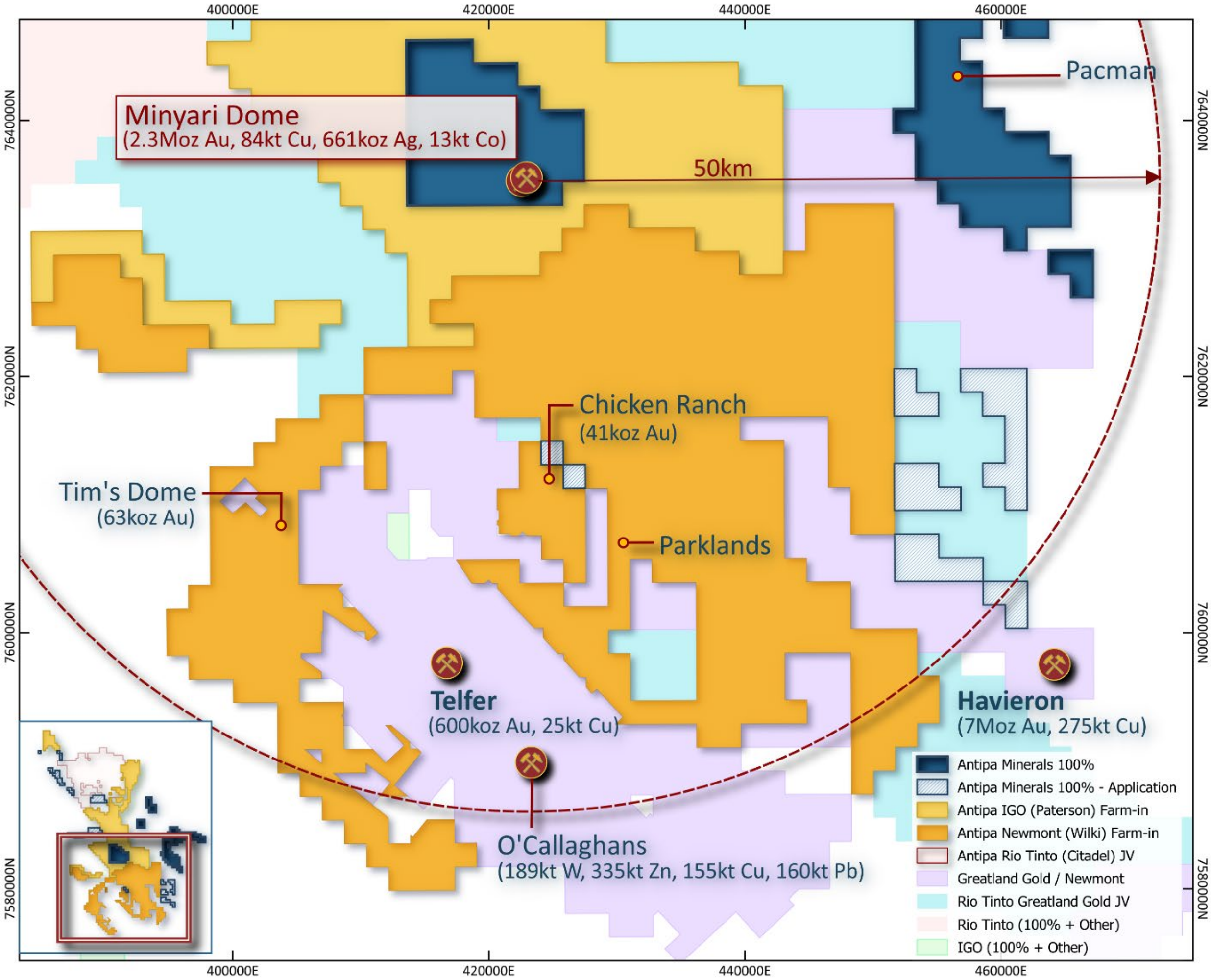

Figure 1: Project Location map showing the southern region of Antipa's Minyari Dome (100%) Project and 35km proximity to Newmont's (soon to be Greatland Gold's) Telfer gold-copper-silver mine and 22Mtpa processing facility.[1] NB: Regional GDA2020 / MGA Zone 51 co-ordinates, 20km grid.

The Company engaged Snowden Optiro and Strategic Metallurgy to complete the Updated Scoping Study for the Minyari Dome Project. The Updated Scoping Study provides a revised preliminary technical and economic study of the Project's potential viability, based on low-level technical and economic assessments (± 35% accuracy). The recommendations outlined in the Updated Scoping Study provide critical guidance for further appraisal of the development potential, including advancing to a Pre-Feasibility Study (**PFS**) and/or Definitive Feasibility Study (**DFS**) level.

The primary source or ore for the Project is the Minyari deposit, which accounts for 95% of the estimated gold ounces, with the remaining 5% sourced from the GEO-01 and WACA deposits. The Updated Scoping Study assessed the viability of two processing facility options at various throughput rates, 1Mtpa, 2Mtpa and 3Mtpa, for both gold-silver (**Gold-Focused**) case and gold-silver-copper-cobalt (**Polymetallic Development**) scenario.

Based on constraints applied in the Updated Scoping Study, including the September MRE, mining rates (both open pit and underground), and metallurgical considerations, a Gold-Focused development with a plant throughput rate of 3Mtpa was identified as the optimal approach at this stage. While the next phase of study is expected to continue evaluation of the Gold-Focused case, it may also include a more detailed analysis of the Polymetallic Development opportunity.

[1] Havieron refer to Greatland Gold plc AIM release dated 21 December 2023, "Havieron Mineral Resource Estimate Update". Telfer and O'Callaghans refer to Newmont Corporation ASX release dated 23 February 2024, "PR as issued - 2023 Reserves and Resources".

Key Study Outcomes and Assumptions

The Updated Scoping Study has confirmed that the Minyari Dome Project represents a potential commercially viable development opportunity. A summary of the initial physical and financial evaluation for the Gold-Focused case at a 3Mtpa throughput rate is provided in Table 1, with additional details included as Appendix A.

Table 1: Scoping Study Evaluation Period Results and Key Assumptions (in A$ unless stated otherwise)

Physicals and Costs			
Mining Physicals – Project Total			
Ore Tonnage	Mt	30.2	
Gold Grade	g/t	1.5	
Contained Ounces Gold	Moz	1.5	
Mining Physicals – Sub-Totals		**Open Pit**	**Underground**
Ore Tonnage	Mt	17.5	12.8
Gold Grade	g/t	1.1	2.1
Contained Ounces Gold	koz	613	863
Strip Ratio	waste:ore	4.5:1	N/A
Gold (Process) Production			
Evaluation Period (excluding pre-production)	Years	10+	
Plant Throughput	Mtpa	3.0	
Total Evaluation Period (10+ years)	Moz	1.3	
Process Recovery Gold (Life of Mine average)	%	89.5	
Average Annual	koz pa	120	
Average Annual – First 10 years	koz pa	130	
Average Annual – Year 5 to Year 9 (i.e. 5 years)	koz pa	141	
Capital and Pre-Production Costs			
Development Capital	$M	208.2	
Open Pit Capital	$M	23.6	
Underground Capital	$M	45.1	
Total Development Capital Cost	$M	**276.9**	
Pre-Production Capital (incl. Mining Capital)	$M	215.8	
Pre-Production Mining (Open Pit)	$M	90.5	
Total Pre-Production Cost	$M	**306.3**	
Operating Costs			
Open Pit Mining	$/t mined	**Ore mined** 26.5	**Total material** 4.80
	$/bcm	12.65	
Underground Mining	$/t ore mined	80.00	
Processing	$/t ore milled	20.58	
General and Administration	$/t ore milled	1.49	
Total Operating Costs	$/t ore milled	**77.70**	

Financials and Key Input Assumptions		
Gold Price	US$/oz	2,100
	A$/oz	3,000
Silver Price	US$/oz	24.50
	A$/oz	35.00
Exchange Rate	AUD:USD	0.70
Discount Rate	%	7.0
Royalty Rate (WA Government + Sandstorm)	NSR %	3.5
All in Sustaining Cost (AISC)		
First 5 year average	US$/oz	1,123
Life of Mine (LOM) average	US$/oz	1,205
Net Cash Flow (Undiscounted)		
NCF Pre-Tax	$M	1,348
NCF Post-Tax	$M	**972**
Net Present Value (discount rate 7%)		
NPV_7% Pre-Tax	$M	834
NPV_7% Post-Tax	$M	**598**
Internal Rate of Return		
IRR Pre-Tax	%	52
IRR Post-Tax	%	46
Payback Period Pre-Tax (NCF basis)	Years	**2.0**

Production Projection

The Project's production profile forecasts annual output of up to 145,000 ounces of gold in Year 5, with an average of 130,000 ounces of gold per annum over the first ten years of mining, and 120,000 ounces of gold per annum over the entire 10+ year evaluation period. Forecast life-of-mine (**LOM**) silver production is 415 koz, equating to an annual average output of 38 koz.

Gold production over the evaluation period is sourced from Indicated and Inferred Mineral Resource tonnage (JORC 2012), with 83% from the Indicated Resource category, and 17% from the Inferred Resource category during the initial two-year payback period, as well as across the full initial evaluation period. The current Minyari deposit alone accounts for 95% of the gold production over the initial evaluation period. Refer to Table 2 and Figure 2 below for a summary of the forecast process production.

Table 2: Annual gold and silver process production (recovered) at 3Mtpa throughput rate

Year	Total	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11
Gold koz	**1,321**	115	114	134	120	145	142	139	144	136	116	17
Silver koz	**415**	28	41	50	34	38	42	46	48	49	30	8

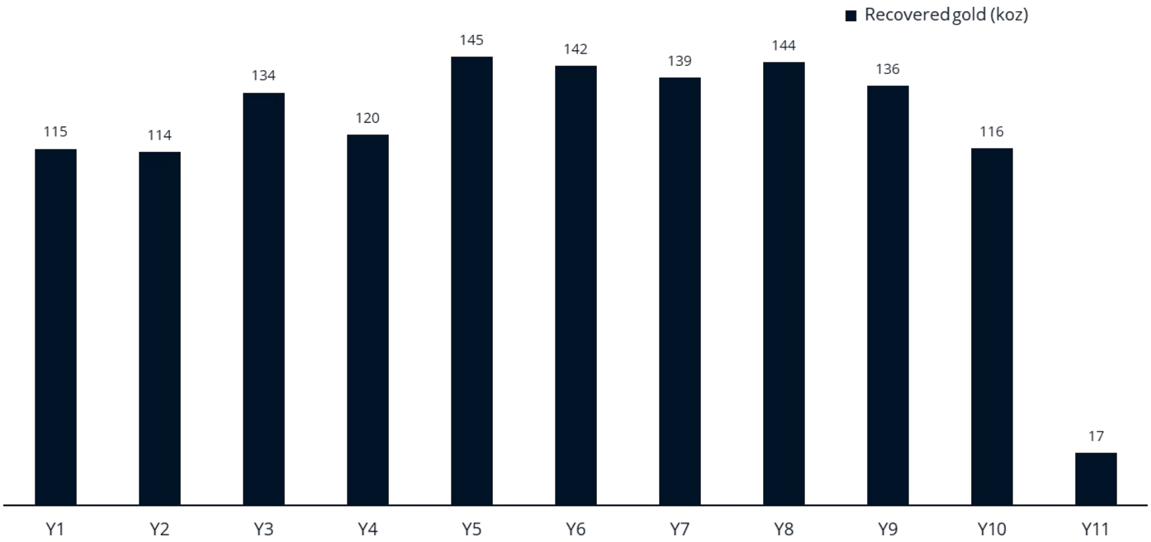

Figure 2: Minyari Dome Project gold production (koz recovered)

Sensitivity Analysis

The sensitivity analysis demonstrates that the Project is resilient to variations in capital costs. However, like most mining projects, its economics are more sensitive to changes in operating costs and revenue factors, including commodity prices (refer to Figures 3 and 4 and Table 3).

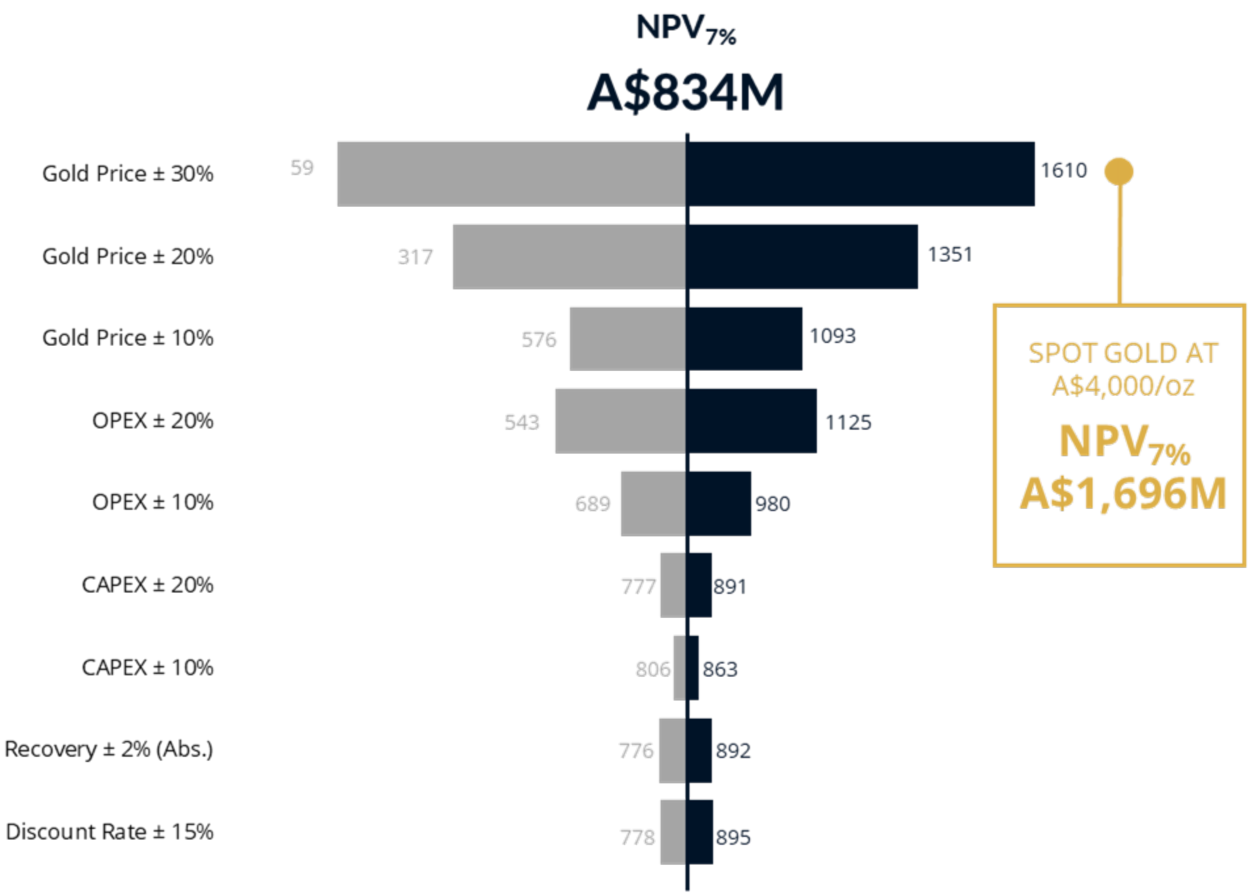

Figure 3: Minyari Dome Project NPV$_{7\%}$ A$834M (pre-tax, A$M discounted) sensitivity analysis

Table 3: Minyari Dome Project sensitivity analysis – gold price assumption scenarios

Gold price (A$/oz)	UoM	$2,700	Base case $3,000	$3,300	$3,600	$3,900	Spot case[1] $4,000	$4,200	$4,500	$5,000
Pre-Tax										
$NPV_{7\%}$	A$M	576	**834**	1,093	1,351	1,610	**1,696**	1,868	2,126	2,557
IRR	%	40	**52**	64	75	87	**91**	98	109	128
Payback	Years	2.25	**2.00**	1.50	1.50	1.25	**1.25**	1.00	0.75	0.75
LOM free cash flow	A$M	775	**1,348**	1,730	2,112	2,494	**2,621**	2,876	3,258	3,895
Post-Tax										
$NPV_{7\%}$	A$M	303	**598**	781	963	1,144	**1,205**	1,326	1,507	1,810
IRR	%	25	**46**	56	66	75	**79**	85	94	110
Payback	Years	2.25	**2.00**	1.5	1.50	1.25	**1.25**	1.00	0.75	0.75
LOM free cash flow	A$M	571	**972**	1,239	1,507	1,774	**1,864**	2,042	2,309	2,755

Figure 4: Minyari Dome Project projected annual post-tax free cash flow (A$M) under various gold price assumptions

Project Configuration

Processing

The Company evaluated two standard processing facility options: a gravity and CIL plant for a Gold-Focused case producing doré gold, and a flotation and gravity facility for the Polymetallic Development scenario, producing separate copper-gold and cobalt concentrates alongside some doré gold. Each processing facility type was assessed at throughput rates of 1Mtpa, 2Mtpa and 3Mtpa. The 3Mtpa CIL Gold-Focused case was identified as the optimal choice at this stage (refer to Figures 5 and 6).

[1] Less than spot gold price 23 October 2024, which exceeds A$4,100.

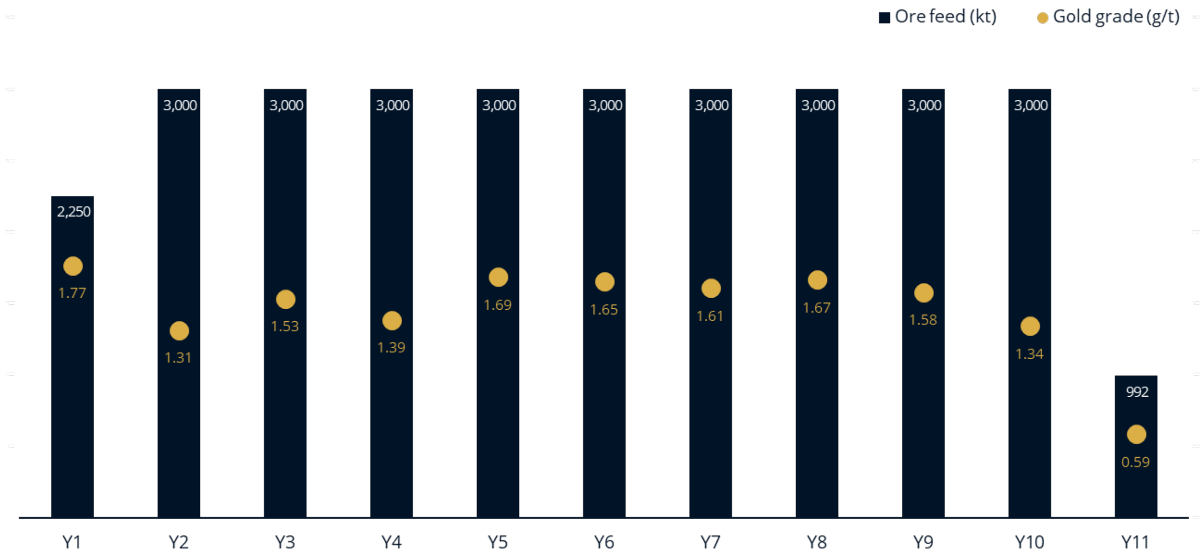

Figure 5: Minyari Dome Project processing schedule

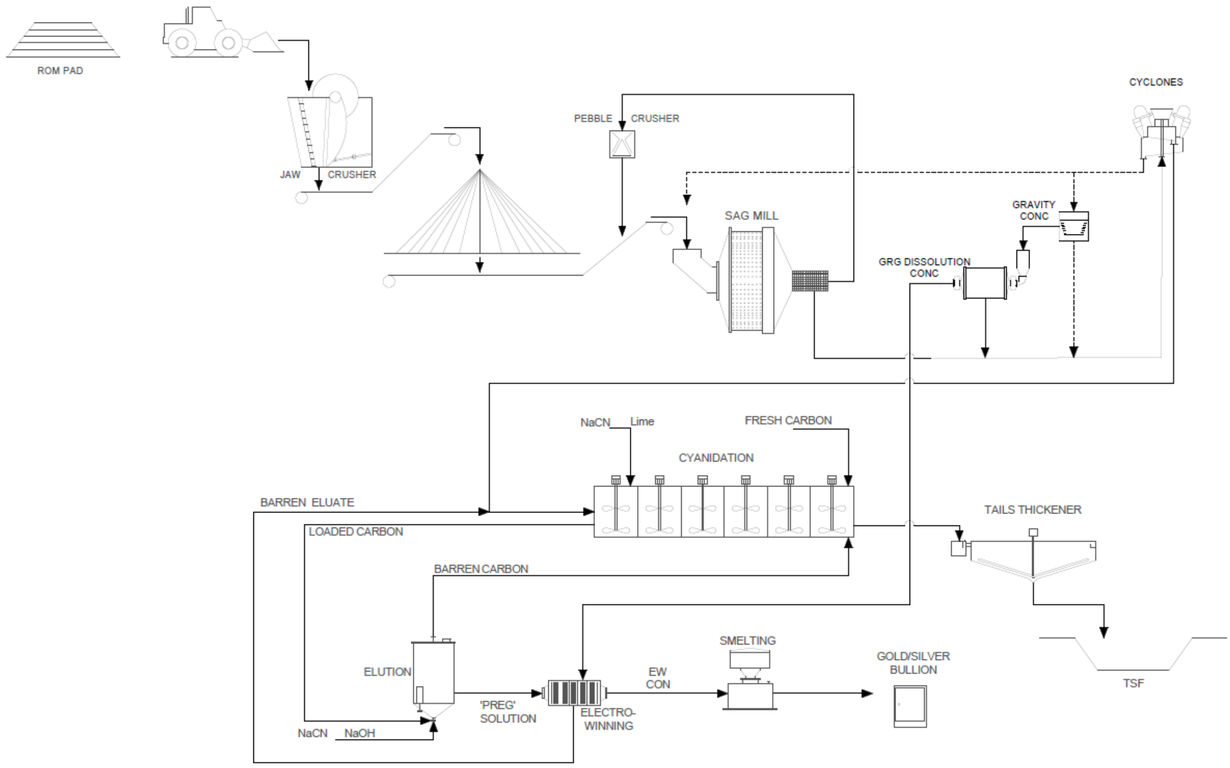

Figure 6: Minyari Dome Project processing facility - block flow diagram of CIL flowsheet

Mining

A contractor mining approach will be employed using standard truck-and-shovel methods across five open pits (see Figures 7 and 8), with the Minyari deposit accounting for 90% of the open-pit gold mining production. The economic cut-off grade for the open-pit has been set at 0.30 g/t.

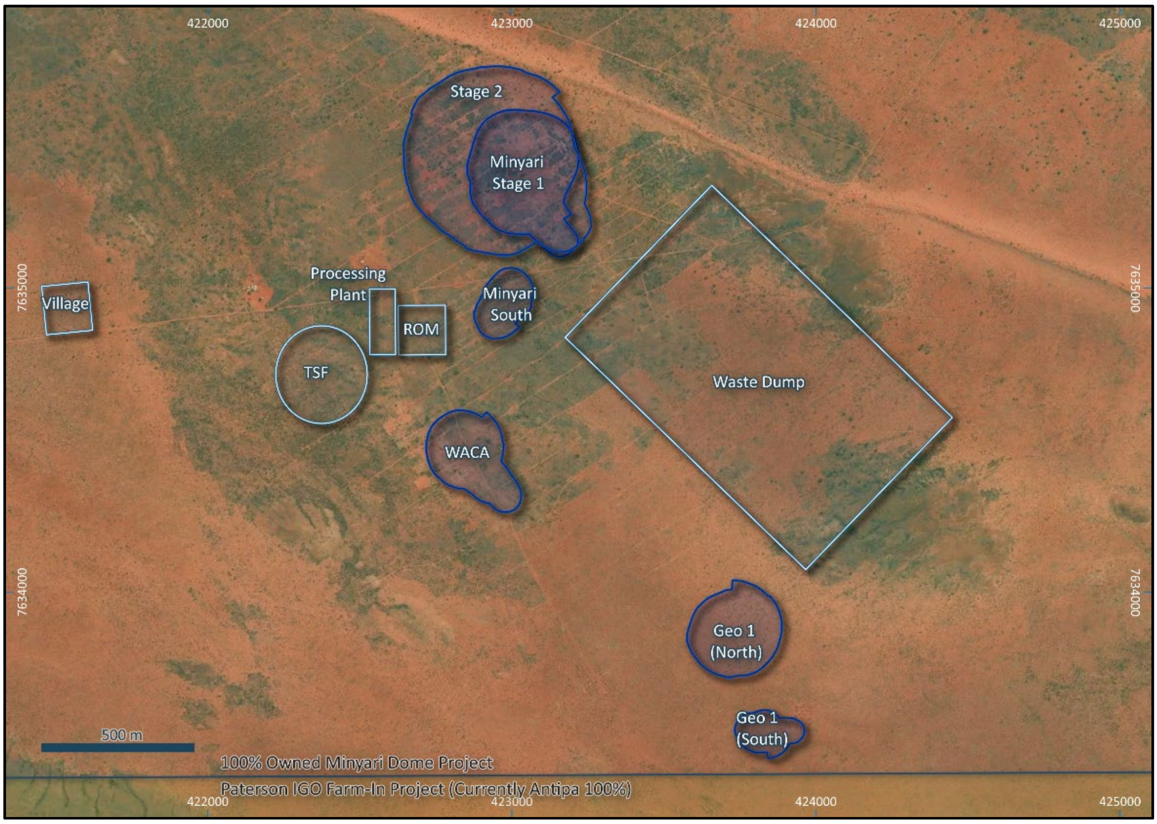

Figure 7: Minyari Dome Project conceptual configuration. NB: Regional GDA2020 / MGA Zone 51 co-ordinates, 1km grid.

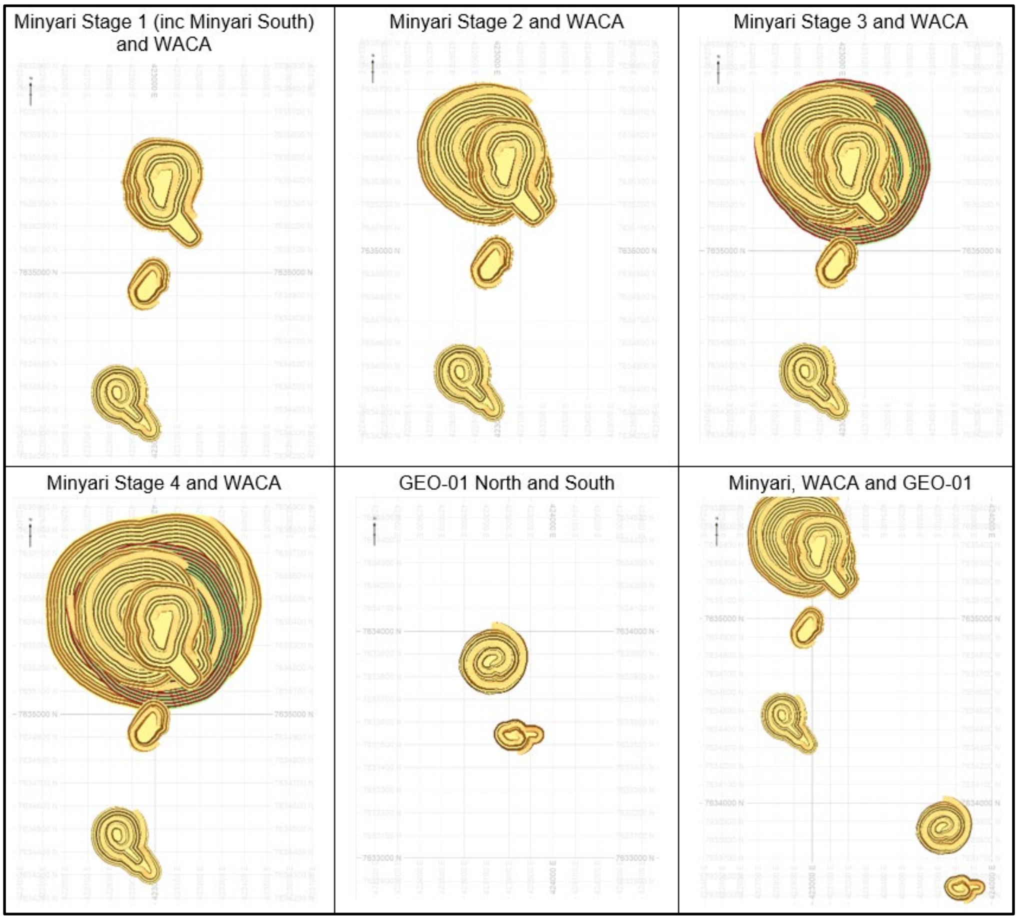

Figure 8: Minyari Dome Project open pit stage sequence. NB: Regional GDA2020 / MGA Zone 51 co-ordinates, 500m grid.

Contractor mining will also be employed for the Minyari deposit underground using Modified Sub-Level Caving (**M-SLC**) methods. The Minyari South open pit will serve as the box-cut for the Minyari deposit's underground portal and decline. The underground mining operations have an economic cut-off grade of 1.50 g/t. The conceptual underground mine design (see Figures 9a-c) includes a decline that also provides a drill platform for further Resource delineation and access to additional underground growth opportunities, including the Minyari and WACA plunge targets, Minyari South, Minyari North and Sundown.

Figures 10 and 11 present an overview of the mining schedule, breaking down ore tonnage by Mineral Resource category and detailing both open-pit and underground sources. The increase in the Y3 mining schedule is due to mining increasing from one open pit for the majority of Y2 to three open pits in Y3, with open pit mining tailing off during Y4 as the lower annual tonnage, at higher grade, underground mining commences.

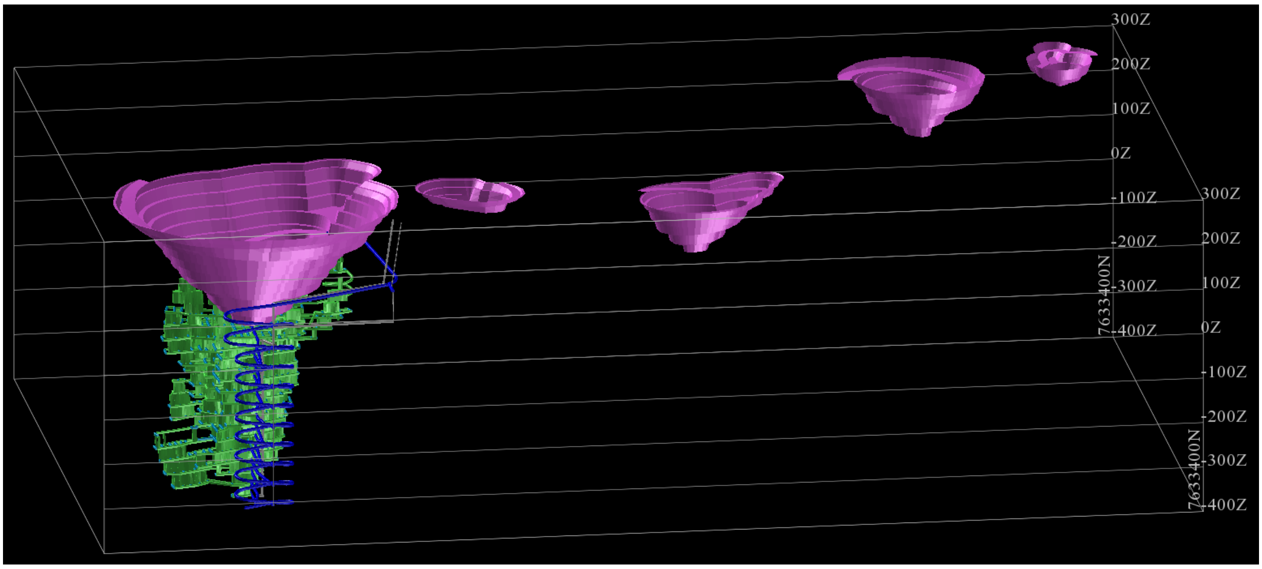

Figure 9a: Minyari Dome Project conceptual open pit and underground mine design (view bearing -16° to 098°)

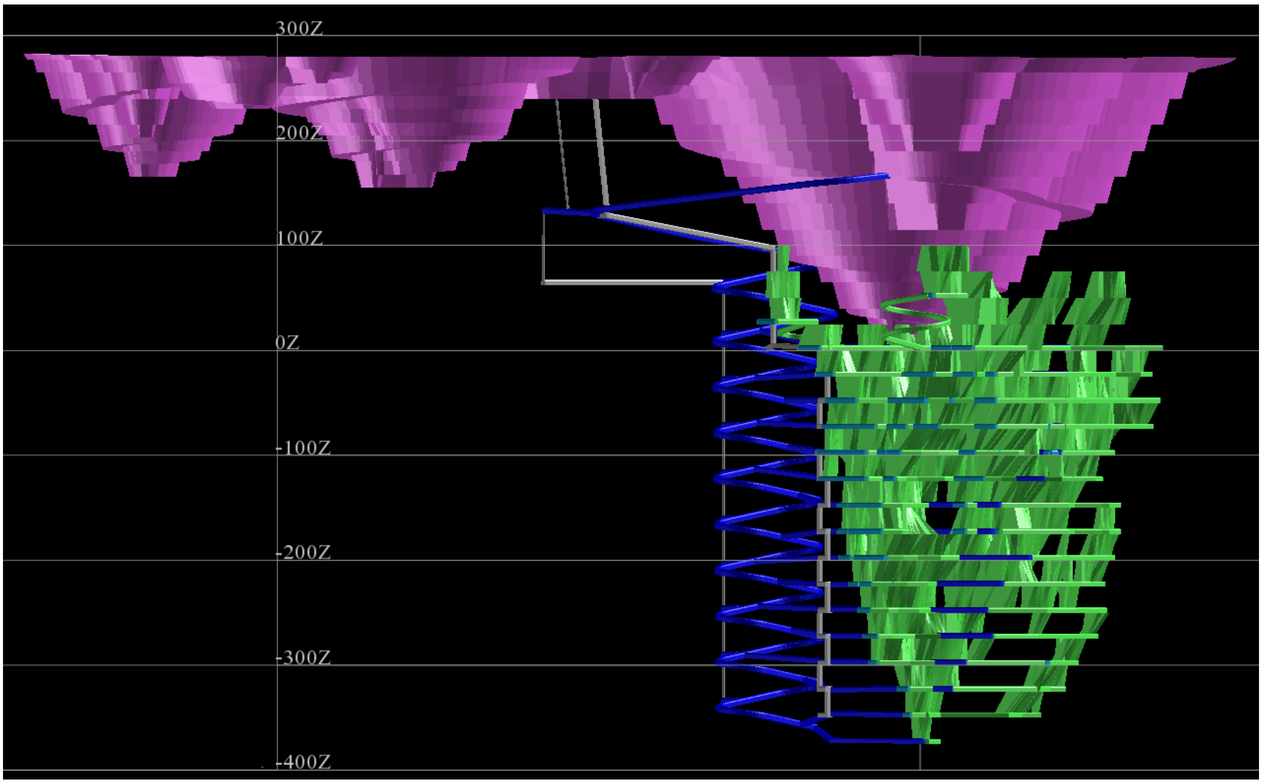

Figure 9b: Minyari Dome Project conceptual open pit and underground mine design (view bearing 0° to 317°)

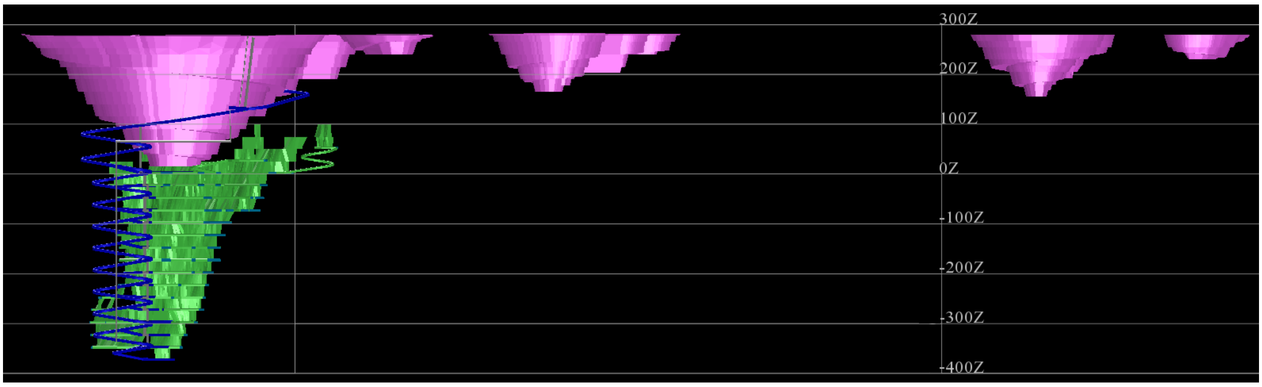

Figure 9c: Minyari Dome Project conceptual open pit and underground mine design (view bearing 0° to 058°)

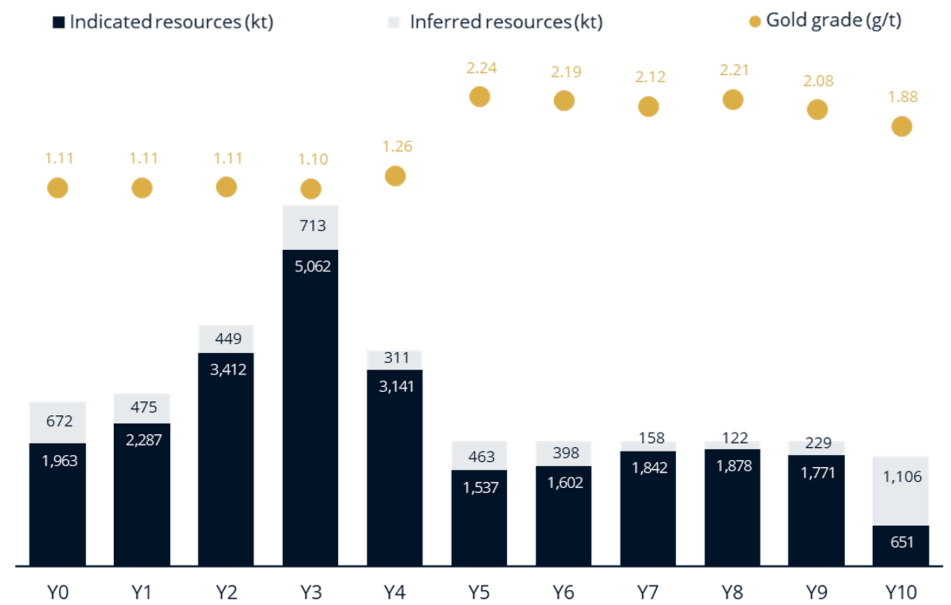

Figure 10: Minyari Dome Project mining schedule by Mineral Resource category

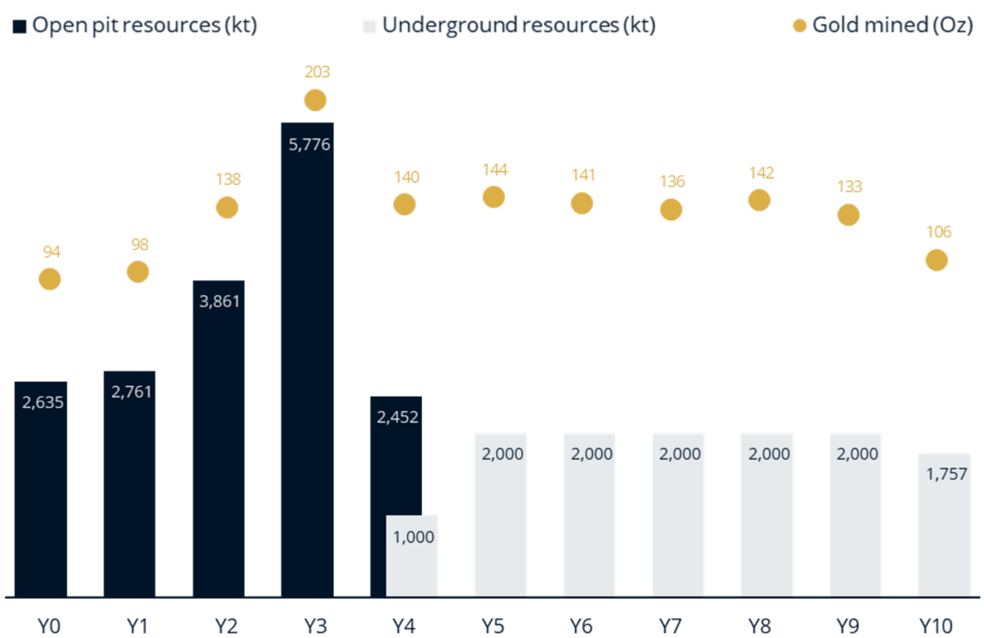

Figure 11: Minyari Dome Project mined ore - open pit and underground

Capital Cost Estimate

Capital cost estimates included in the Updated Scoping Study have been prepared by independent consultants Snowden Optiro and Strategic Metallurgy, covering three key areas: mining, processing and administration. These estimates were derived using a desktop approach, with an accuracy of ± 35%, which is typical for a Scoping Study (refer to Table 4).

Pre-production mining costs are estimated at A$90.5 million, covering open pit mining activities prior to the commencement of commercial production. The operating strategy adopted is designed to maximise gold output during the first four years by prioritising the processing of high-grade ore stockpiles, thus optimising the Project's net present value and internal rate of return. The amount of pre-production open pit mining can be flexed to reduce pre-production funding requirements, with further review to occur as part of future technical analysis.

Table 4: Project Capital Cost Estimate for a 3Mtpa Plant and Associated Infrastructure (LOM Development and Sustaining)

Area	Cost Estimate (A$M)
Processing Plant (3Mtpa CIL)	96.2
Contingency	9.6
Infrastructure - Process	36.0
EPCM	14.5
Process Plant Other (including Spares and Temporary Works)	3.5
Reagents	2.6
Tailings Storage Facility (TSF)	16.6
Infrastructure – General/Other (including Camp)	29.3
Open Pit CAPEX	23.6
Underground CAPEX	45.1
Total	**276.9**
Pre-production Open Pit Mining	90.5

Operating Cost Estimate

Operating costs have also been estimated for mining, processing and administration. These estimates were derived using a first-principles desktop study approach, with an accuracy of ± 35% (refer to Table 5).

Consultants Snowden Optiro independently estimated the open pit and underground mining costs based on a contractor mining strategy. The estimates were developed considering the appropriate equipment sizing for both open pit and underground operations, tailored to each deposit and the necessary mining rates. Haulage costs to the run of mine (**ROM**) and waste rock dump were included in the overall operating cost assumptions.

Strategic Metallurgy conducted an independent assessment of the processing operating cost estimate for a 3Mtpa throughput rate, which also included relevant administrative costs.

Table 5: Operating Cost Estimate (rounded)

Area	Cost Estimate (A$)
Mining – Open Pit	26.50/t ore
Mining – Underground	80.00/t ore
Processing	20.58/t ore
Administration	1.49/t ore

Comparison of the Updated Scoping Study (2024) to the August 2022 Scoping Study

A summary comparison of the key physical and financial evaluation inputs and outputs for the Gold-Focused case at a 3Mtpa throughput rate for this Updated Scoping Study (2024) and the initial August 2022 Scoping Study[1] is presented in Table 6.

Table 6: October 2024 Updated Scoping Study Update compared to the August 2022 Scoping Study

Scoping Study Inputs		October 2024	August 2022
Mineral Resource Estimate			
Tonnage	Mt	47.6	33.9
Grade Gold	g/t	1.5	1.6
Contained Ounces Gold	Moz	2.32	1.75
Grade Silver	g/t	0.4	0.5
Contained Ounces Silver	koz	661	585
Grade Copper	%	0.2	0.2
Contained Copper Metal	kt	84	64
Grade Cobalt	%	0.03	0.03
Contained Cobalt Metal	kt	13	11
Indicated Proportion of MRE Tonnage	%	71	56
Gold Oz Conversion MRE to Mining Inventory	%	64	62
Financial Inputs			
Gold Price	US$/oz	2,100	1,750
	A$/oz	3,000	2,430
Silver Price	US$/oz	24.50	22.00
	A$/oz	35.00	30.56
Exchange Rate	AUD:USD	0.70	0.72
Discount Rate	%	7.0	7.0
Royalty Rate (WA Government + Sandstorm)	NSR %	3.5	3.5
Capital and Pre-Production Costs			
Plant Throughput	Mtpa	3.0	3.0
Development Capital	$M	208.2	167.4
Open Pit Capital	$M	23.6	15.5
Underground Capital	$M	45.1	24.4
Total Development Capital Cost	$M	**276.9**	**207.3**
Pre-Production Capital (incl. Mining Capital)	$M	215.8	177.7
Pre-Production Mining (Open Pit)	$M	90.5	67.7
Total Pre-Production Cost (Capital + OPEX)	$M	**306.3**	**245.4**
Operating Costs			
Open Pit Mining	$/bcm	12.65	9.86
Underground Mining	$/t ore mined	80.00	80.00
Processing (excluding GEO-01)	$/t ore milled	20.78	19.20
General and Administration	$/t ore milled	1.49	1.40
Total Operating Costs	$/t ore milled	**77.70**	**70.00**

[1] Minyari Dome Project 2022 Scoping Study ASX release dated 23 February 2024, "Strong Minyari Dome Scoping Study Outcomes".

Scoping Study Outputs		October 2024	August 2022
Evaluation Period (excl. pre-production)	Years	10+	7+
Mining Inventory			
Open Pit			
Strip Ratio	waste:ore	4.5:1	5:1
Ore Tonnage	Mt	17.5	13.5
Grade Gold	g/t	1.1	1.1
Contained Ounces Gold	koz	613	486
Grade Silver	g/t	0.4	0.5
Contained Ounces Silver	koz	222	215
Underground			
Ore Tonnage	Mt	12.8	7.9
Grade Gold	g/t	2.1	2.4
Contained Ounces Gold	koz	863	603
Grade Silver	g/t	0.6	0.7
Contained Ounces Silver	koz	241	175
Total Mining Inventory (Open Pit + Underground)			
Ore Tonnage	Mt	30.2	21.4
Grade Gold	g/t	1.5	1.6
Contained Ounces Gold	koz	1,476	1,090
Grade Silver	g/t	0.5	0.6
Contained Ounces Silver	koz	463	390
Mining Inventory in the Indicated category	Ind. MRE %	83	72
Gold (Process) Production (Recovered)			
Process Recovery Gold (LOM average)	%	89.5	90.0
Total Evaluation Period	Moz	1.3	1.0
Average Annual	koz pa	120	122
Financial Outputs			
AISC			
First 5 year average	US$/oz	1,123	1,088
Life of Mine (LOM) average	US$/oz	1,205	1,062
Net cash flow (undiscounted)			
Pre-tax	$M	1,348	672
Post-tax	$M	972	491
NPV_7%			
Pre-tax	$M	834	392
Post-tax	$M	598	278
IRR			
Pre-tax	%	52	34
Post-tax	%	46	29
Payback Period (Net Cash Flow basis)			
Pre-tax	Years	2.0	2.5

Development Funding

The Updated Scoping Study outlines a potential future development of the Minyari Dome Project that is considered low risk and technically straightforward, with very strong economic fundamentals, providing a solid foundation for sourcing traditional financing from debt and equity markets. Antipa plans to initiate discussions with potential financiers during the next stage of technical analysis and intends to appoint a debt advisor. However, there is no guarantee that funding will be available when required.

To achieve the various outcomes outlined in the Updated Scoping Study, pre-production funding of up to A$306 million on an annualised cash flow basis may be required. Typically, development financing would include a mix of debt and equity. Antipa has formed the view that there is a reasonable basis to expect that the requisite funding for future development of the Minyari Dome Gold Project will be available, based on the following factors:

- The Project is 100%-owned, located in a tier-one jurisdiction, with simple, non-refractory metallurgy enabling an industry-standard CIL process plant and offering a rapid payback period of only two years from the start of commercial production. These factors are expected to reduce funding complexity significantly.
- Even with a conservative gold price forecast of A$3,000 per ounce (approximately 37% below the current spot price of A$4,100[1]), the Project's robust post-tax cashflows of A$972 million and rapid payback period make it a strong candidate for conventional debt financing. Key financial metrics, including a pre-tax $NPV_{7\%}$ of A$834 million and an IRR of 52%, further enhance its attractiveness to potential financiers.
- Significant potential exists for growth in the Project's Mineral Resource base, which forms the basis of the Updated Scoping Study. The recently commenced CY2024 Phase 2 exploration programme is designed to test a range of gold-silver±copper±cobalt extensional targets and prospect areas. Many of these targets are located within 1.5 km of the Minyari deposit. The key objective of this programme is to increase the overall size of the existing MRE, which could reasonably be expected to further strengthen the Project's economics.
- The anticipated completion of Antipa's A$17 million all-cash sale of its interest in the Citadel Joint Venture Project to Rio Tinto will boost Antipa's cash reserves to approximately A$23 million, providing a strong financial foundation for the ongoing development of the Project.
- The Company has a proven track record of raising equity funds as and when required to support the exploration and evaluation of its assets.
- Antipa's Board and management bring extensive experience in mine development, financing and production within Western Australia's resource sector.

Conclusions and Recommendations

The Updated Scoping Study has confirmed that the Minyari Dome Project represents a commercially viable stand-alone gold mining and processing operation.

Ongoing exploration, targeting additional resource growth, plus delineation drilling and further metallurgical testing is expected to continue to unlock substantial underlying value.

A stand-alone development for the Project remains Antipa's preferred base case, the proximity to the Telfer 22Mtpa processing facility, means all potential third-party pathways that might offer greater risk-weighted value for Antipa shareholders will be assessed on an ongoing basis.

Next Steps

The Project's economic outlook remains highly positively leveraged to future Resource growth. A CY2024 Phase 2 drilling campaign is underway which is targeting delivery of additional brownfield Mineral Resources and additional greenfield discoveries.

[1] Approximate spot gold price 23 October 2024.

The Phase 2 drilling programme is currently scheduled to include 70 drill holes for a total of up to 11,000 metres, comprising:

- 66 reverse circulation (**RC**) holes for up to 10,000 metres; and
- Four diamond core holes for up to 1,000 metres.

In parallel, the Company will continue to advance various technical work streams designed to further de-risk and refine the development opportunity.

Consistent with previous years, the Minyari Dome Project Exploration Programme and budget will be subject to ongoing review based on results, field conditions, contractor availability and pricing, and other relevant matters.

Release authorised by

The Board of Directors

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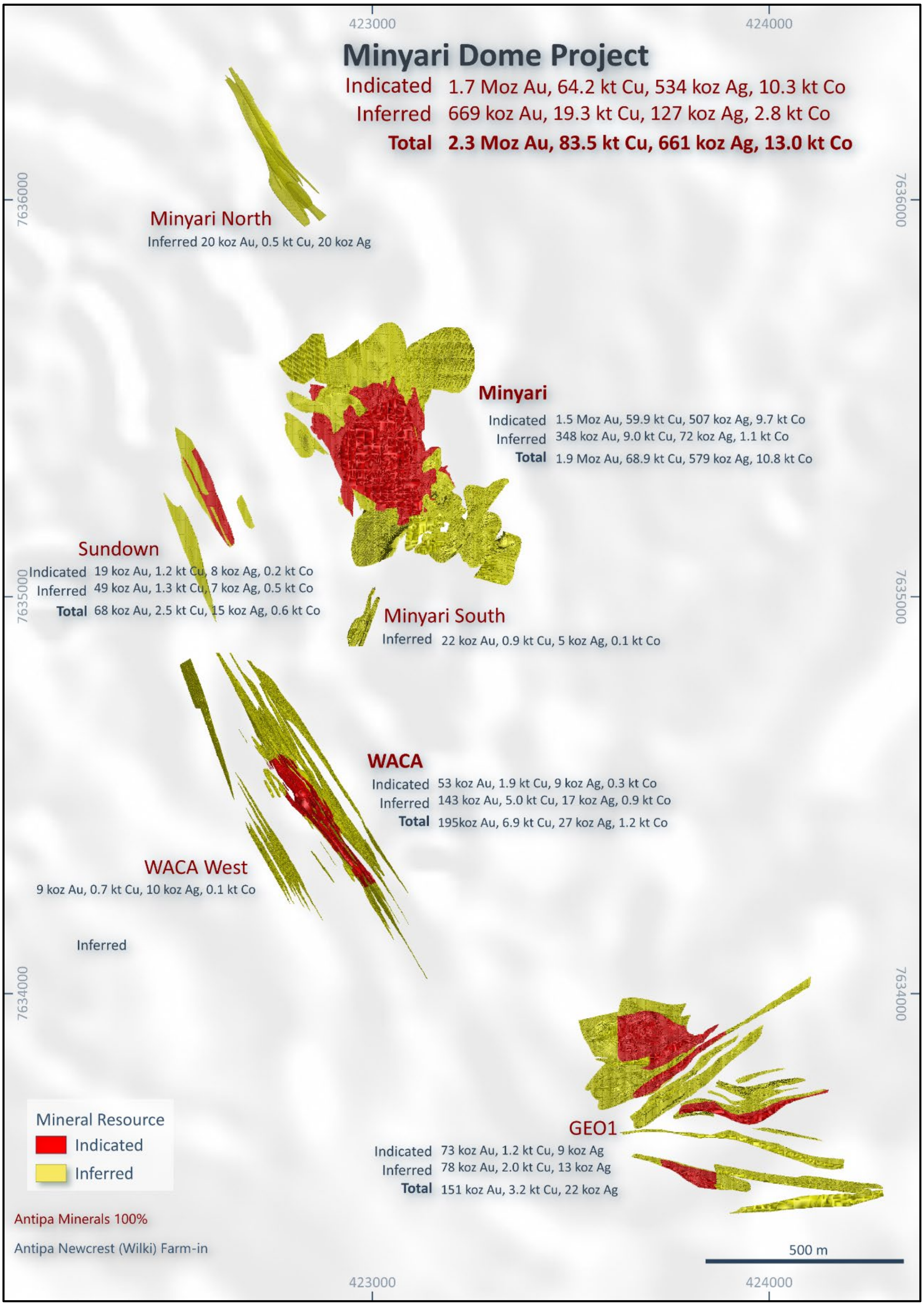


Figure 12: Map of the southern region of the Minyari Dome area showing Mineral Resource locations. NB: Over (transparent) airborne magnetic image (50m flight-line spacing; grey-scale TMI-RP) and Regional GDA2020 / MGA Zone 51 co-ordinates, 1km grid.

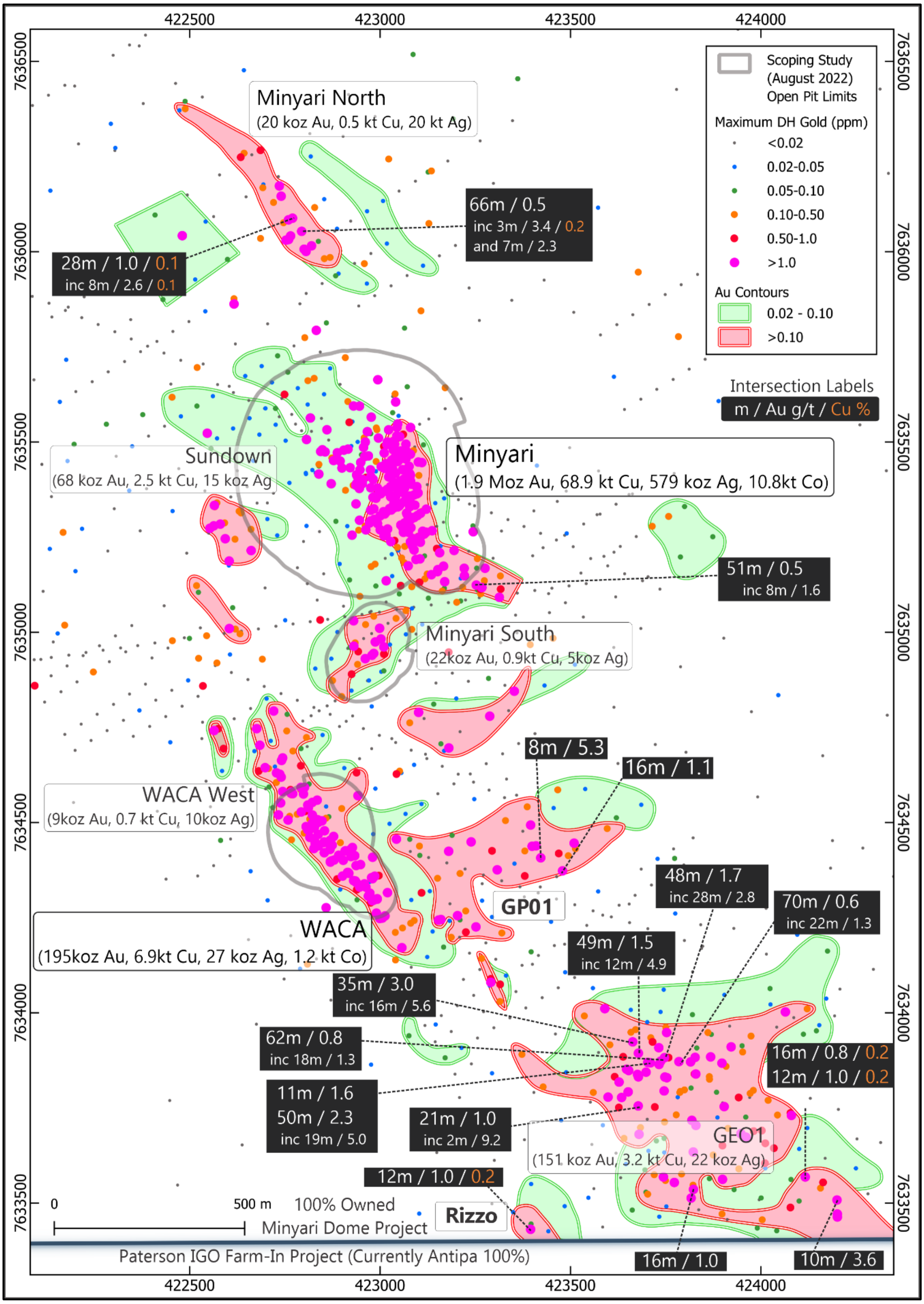


Figure 13: Map of the southern region of the Minyari Dome area showing Mineral Resource locations, October 2024 Scoping Study open pit limits, and contoured maximum down-hole gold drill results, locations, and drill hole results.
NB: Regional GDA2020 / MGA Zone 51 co-ordinates, 500m grid.

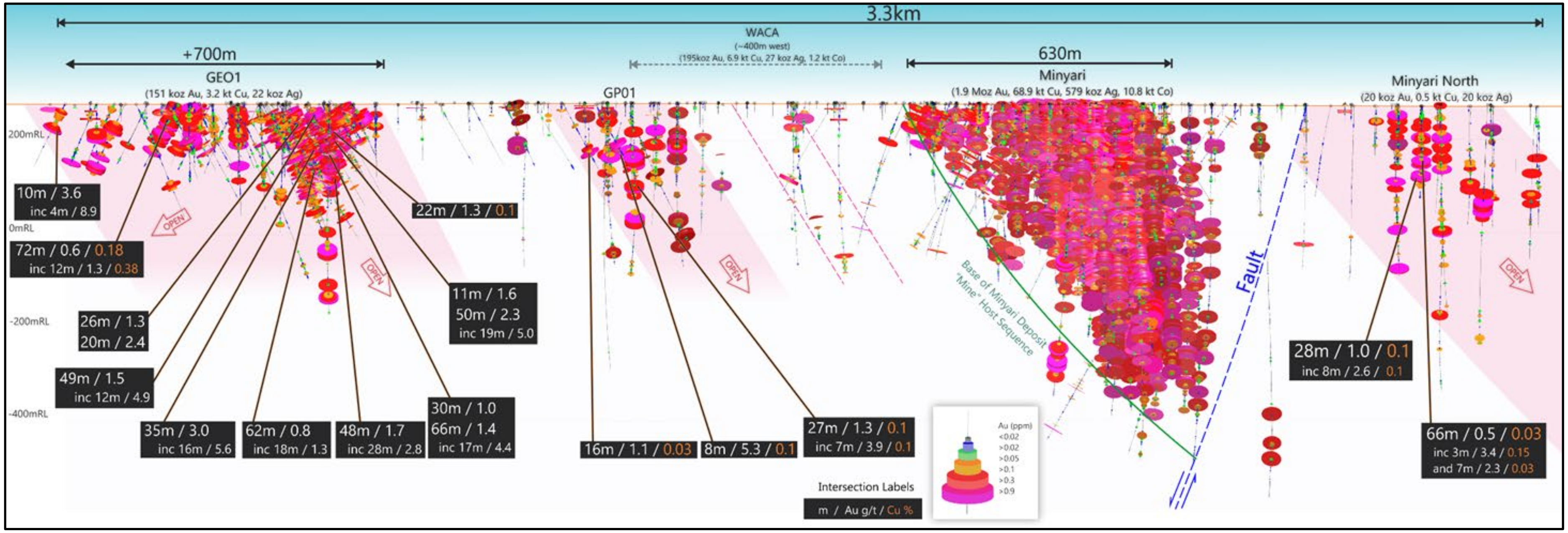


Figure 14: Long Section from GEO-01 to Minyari North including Minyari and GP01 showing gold drill intercepts and interpreted key features including multiple zones of plunging gold-copper mineralisation. Note the highly prospective 3.3km trend which extends to 4.6km including the Judes copper-silver-gold deposit. NB: 200m elevation (RL), looking toward Local Grid 270° (or 238° MGA Zone 51 Grid).

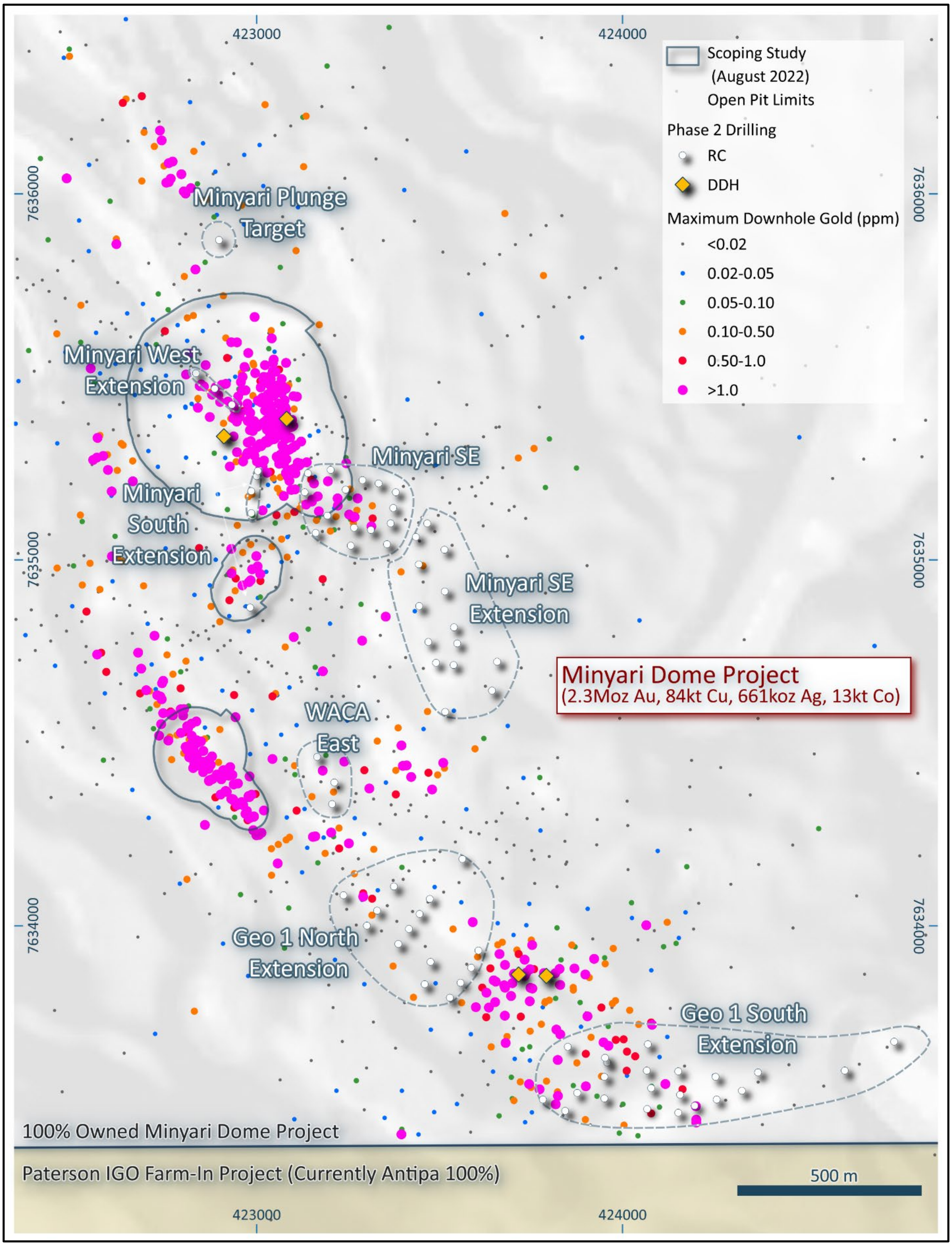


Figure 15: Map of the southern region of the Minyari Dome area showing the location of the Phase 2 drilling programme target areas, planned drill holes and the August 2022 Scoping Study open pit limits and maximum down-hole gold drill results. NB: Over (transparent) airborne magnetic image (50m flight-line spacing; grey-scale TMI-RP) and Regional GDA2020 / MGA Zone 51 co-ordinates, 1km grid.

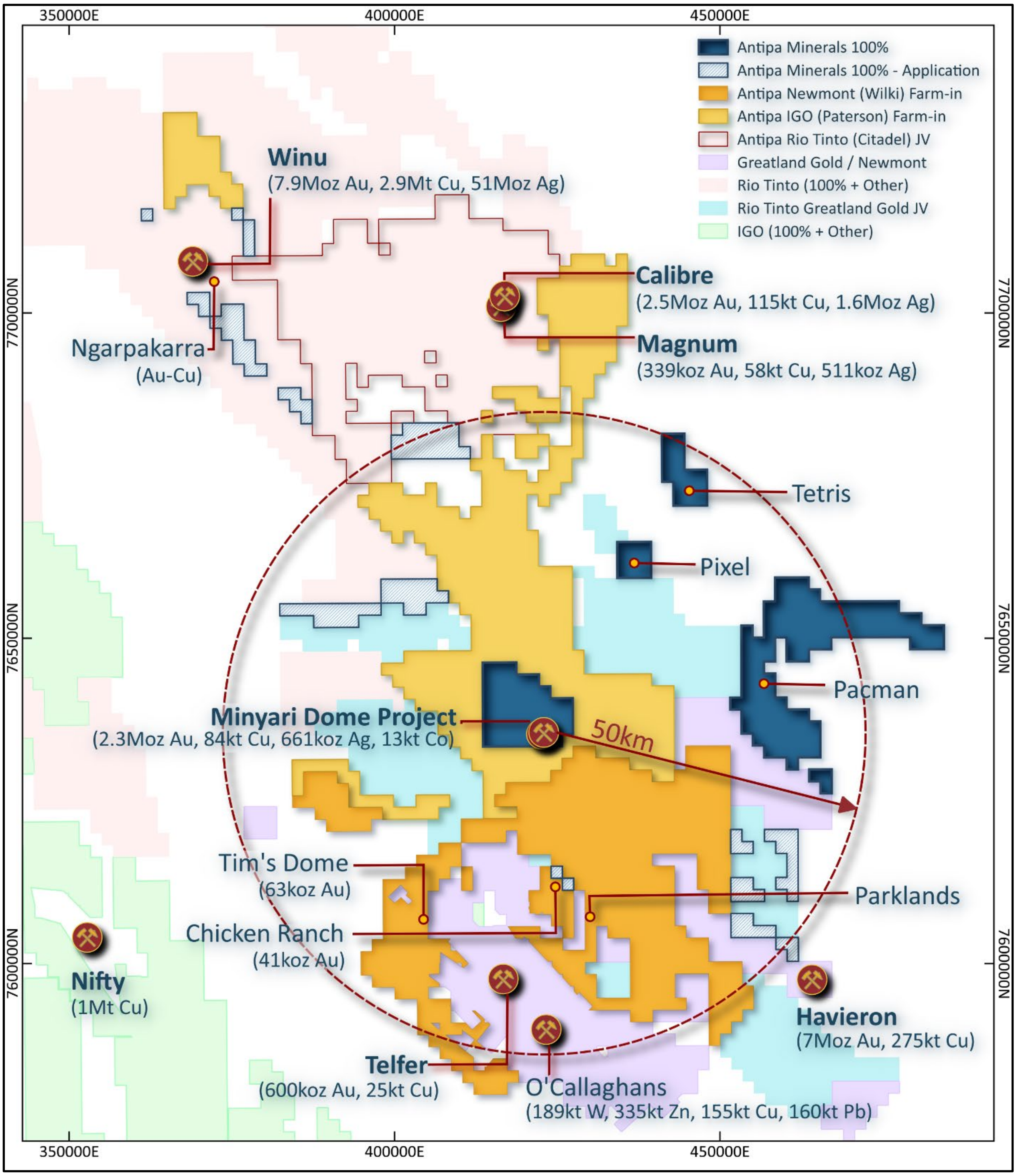


Figure 16: Plan showing location of Antipa's 100%-owned Minyari Dome Project, Rio Tinto-Antipa Citadel Joint Venture Project, including the Calibre and Magnum resources. Also shows Antipa-Newmont Wilki Farm-in, Antipa-IGO Paterson Farm-in, Newmont's Telfer Mine and O'Callaghans deposit, Rio Tinto's Winu deposit, Greatland Gold-Newmont's Havieron development project and Cyprium's Nifty Mine.[1]

NB: Rio and IGO tenement areas include related third-party Farm-in's/Joint Ventures.

NB: Regional GDA2020 / MGA Zone 51 co-ordinates, 50km grid.

[1] Havieron refer to Greatland Gold plc AIM release dated 21 December 2023, "Havieron Mineral Resource Estimate Update". Winu refer to Rio Tinto Ltd ASX release dated 22 February 2023, "Changes to Ore Reserves and Mineral Resources". Telfer and O'Callaghans refer to Newmont Corporation ASX release dated 23 February 2024, "PR as issued - 2023 Reserves and Resources". Nifty refer to Cyprium Metals Ltd ASX release dated 14 March 2024, "Updated Nifty MRE Reaches 1M Tonnes Contained Copper".

About Antipa Minerals: Antipa Minerals Ltd (ASX: **AZY**) (**Antipa** or the **Company**) is a leading mineral exploration company with a strong track record of success in discovering world-class gold-copper deposits in the highly prospective Paterson Province of Western Australia. The Company's exploration and advancement programmes remain focused on identifying and unlocking the full potential of the region, which offers significant opportunities for profitable mining operations.

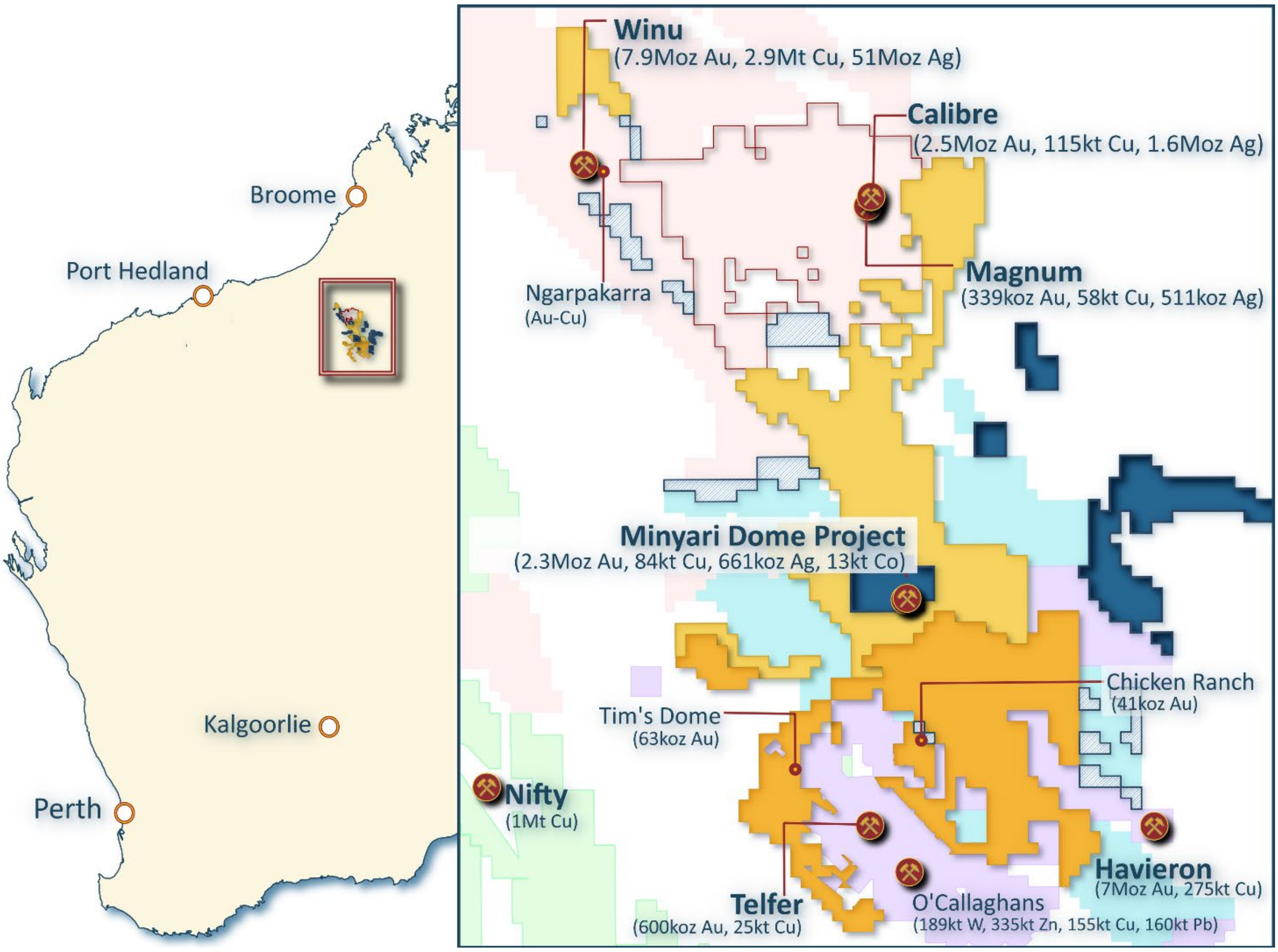
The Company's tenement granted holding covers over 5,100km^2 and hosts attributable Mineral Resources of 3.3Moz of gold, 139kt of copper and 1.3Moz of silver, in a region that is home to Newmont's world-class Telfer mine and some of the world's more recent large gold-copper discoveries including Rio Tinto's Winu and Newmont-Greatland Gold's Havieron.

Exploration success has led to the discovery of several major mineral deposits on Antipa's ground, including the wholly owned, flagship 880km^2 Minyari Dome Gold-Copper Project. Minyari Dome currently hosts a 2.3Moz gold at 1.5 g/t Mineral Resource (2024 MRE). The October 2024 Scoping Study indicated the potential for a sizeable initial development with further upside.

Antipa is pursuing an aggressive drilling programme this year, targeting substantial and rapid growth to the existing gold-copper resources at Minyari Dome, delivering strong further value enhancement to the existing development opportunity, and making new significant gold-copper discoveries.

The 880km^2 Minyari Dome Project is complemented by three large-scale growth projects covering a total of 4,200km^2 which have attracted major listed miners to agree multi-million-dollar farm-in and joint venture (**JV**) arrangements:

- Wilki Project (100% Antipa): Newmont farming-in 1,470km^2
- Paterson Project (100% Antipa): IGO farming-in 1,550km^2
- Citadel Project (32% Antipa): Rio Tinto JV over 1,200km^2 (note the previous announcement of Antipa's sale of its interest to Rio Tinto for A$17 million, which is expected to complete later this month)



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Minyari Dome Project (Antipa 100%) September 2024 MRE

Minyari Dome Project (Antipa 100%)[1]										
Deposit	**Classification**	**Tonnes**	**Au g/t**	**Au ounces**	**Ag g/t**	**Ag ounces**	**Cu %**	**Cu tonnes**	**Co %**	**Co tonnes**
Minyari	Indicated	27,100,000	1.75	1,505,000	0.58	507,000	0.22	59,800	0.04	9,720
Minyari	Inferred	6,200,000	1.78	347,000	0.36	72,000	0.15	9,000	0.02	1,000
Total Minyari		**33,300,000**	**1.73**	**1,852,000**	**0.54**	**579,000**	**0.21**	**68,900**	**0.03**	**10,800**
WACA	Indicated	1,710,000	0.96	53,000	0.17	9,000	0.11	1,900	0.02	300
WACA	Inferred	3,454,000	1.27	143,000	0.16	17,000	0.14	5,000	0.02	900
Total WACA		**5,164,000**	**1.18**	**195,000**	**0.16**	**26,000**	**0.13**	**6,900**	**0.02**	**1,200**
WACA West	Inferred	403,000	0.73	9,400	0.77	10,010	0.19	750	0.03	101
Total WACA West		**403,000**	**0.73**	**9,400**	**0.77**	**10,010**	**0.19**	**750**	**0.03**	**101**
Minyari South	Inferred	151,000	4.52	22,000	1.04	5,000	0.59	900	0.05	100
Total Minyari South		**151,000**	**4.52**	**22,000**	**1.04**	**5,000**	**0.59**	**900**	**0.05**	**100**
Sundown	Indicated	442,000	1.31	19,000	0.55	8,000	0.27	1,200	0.03	100
Sundown	Inferred	828,000	1.84	49,000	0.27	7,000	0.16	1,300	0.06	500
Total Sundown		**1,270,000**	**1.65**	**68,000**	**0.37**	**15,000**	**0.19**	**2,500**	**0.05**	**600**
GEO-01	Indicated	2,992,000	0.76	73,000	0.1	10,000	0.04	1,200	0.003	100
GEO-01	Inferred	3,748,000	0.65	78,000	0.11	13,000	0.05	2,000	0.003	100
Total GEO-01		**6,740,000**	**0.70**	**151,000**	**0.10**	**23,000**	**0.05**	**3,200**	**0.00**	**200**
Minyari North	Inferred	587,000	1.07	20,000	0.15	3,000	0.09	500	0.01	60
Total Minyari North		**587,000**	**1.07**	**20,000**	**0.15**	**3,000**	**0.09**	**500**	**0.01**	**60**
Total Indicated		**32,200,000**	**1.59**	**1,650,000**	**0.52**	**534,000**	**0.20**	**64,000**	**0.03**	**10,000**
Total Inferred		**15,400,000**	**1.35**	**670,000**	**0.26**	**127,000**	**0.13**	**19,500**	**0.02**	**3,000**
Total Minyari Dome Project		**47,600,000**	**1.51**	**2,320,000**	**0.43**	**661,000**	**0.18**	**84,000**	**0.03**	**13,000**

Notes to Minyari Dome Project MRE Table above:

1. Discrepancies in totals may exist due to rounding.
2. The Mineral Resource has been reported at cut-off grades above 0.4 g/t and 1.5 g/t gold equivalent (**Aueq**); the calculation of the metal equivalent is documented below.
3. The 0.4 g/t and 1.5 g/t Aueq cut-off grades assume open pit and underground mining, respectively.
4. The Minyari Dome Project and its Mineral Resource are 100%-owned by Antipa Minerals.

Citadel Project (Antipa 32% and Rio Tinto 68% Joint Venture) Mineral Resource Estimates

Citadel Project (Antipa 32%)									
Deposit	**Cut-off**	**Category**	**Tonnes (Mt)**	**Au grade (g/t)**	**Cu grade (%)**	**Ag grade (g/t)**	**Au (Moz)**	**Cu (t)**	**Ag (Moz)**
Calibre (August 2024)	0.4 Aueq	Inferred	111	0.71	0.10	0.44	2.50	115,000	1.6
Magnum (February 2015)	0.5 Aueq	Inferred	16	0.70	0.37	1.00	0.34	58,000	0.5
Total Citadel Project (100% basis)			**127**	**0.71**	**0.13**	**0.51**	**2.84**	**173,000**	**2.1**

Notes to Citadel Joint Venture Project MRE Table above:

1. Small discrepancies may occur due to the effects of rounding.
2. The Calibre and Magnum Mineral Resources have been reported at cut-off grades above 0.4 g/t and 0.5 g/t gold equivalent (**Aueq**) respectively; the calculation of the metal equivalents are documented below.
3. Both the 0.4 g/t and 0.5 g/t Aueq cut-offs assume open pit mining.
4. Citadel Project Mineral Resources are tabled on a 100% basis, with current joint venture interests being approximately Antipa 32% and Rio Tinto 68%.

Wilki Project (Antipa 100%) May 2019 Mineral Resource Estimate

Wilki Project (Antipa 100%)					
Deposit	**Cut-off**	**Category**	**Tonnes (Mt)**	**Au grade (g/t)**	**Au (oz)**
Chicken Ranch	0.5 Au	Inferred	0.8	1.6	40,300
Tims Dome	0.5 Au	Inferred	1.8	1.1	63,200
Total Wilki Project			**2.4**	**1.3**	**103,500**

Notes – Wilki Project MRE Table above:

1. Small discrepancies may occur due to the effects of rounding.
2. The Wilki Project Mineral Resource has been reported at a cut-off grade above 0.5 g/t gold (**Au**).
3. The 0.5 g/t Au cut-off assumes open pit mining.
4. Wilki Project Mineral Resources are tabled on a 100% basis, with current interests being Antipa 100% and farm-in partner Newmont Corporation 0%.

Competent Persons Statement – Mineral Resource Estimations for the Minyari Dome Project Deposits, Chicken Ranch Area Deposits, Tim's Dome Deposit and Calibre and Magnum Deposits: The information in this document that relates to the estimation and reporting of the Minyari Dome Project deposits Mineral Resources is extracted from the report entitled "100% Owned Minyari Dome Project Grows by 573,000 Oz of Gold" created on 17 September 2024 with Competent Persons Ian Glacken, Jane Levett and Victoria Lawns, the Tim's Dome and Chicken Ranch deposits Mineral Resource information is extracted from the report entitled "Chicken Ranch and Tims Dome Maiden Mineral Resources" created on 13 May 2019 with Competent Person Shaun Searle, the Calibre deposit Mineral Resource information is extracted from the report entitled "Calibre Gold Resource Increases 19% to 2.5 Moz - Citadel JV" created on 26 August 2024 with Competent Person Susan Havlin, and the Magnum deposit Mineral Resource information is extracted from the report entitled "Calibre and Magnum Deposit Mineral Resource JORC 2012 Updates" created on 23 February 2015 with Competent Person Patrick Adams, all of which are available to view on www.antipaminerals.com.au and www.asx.com.au. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the relevant original market announcements continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.

Competent Persons Statement – 2024 Updated Scoping Study for the Minyari Dome Project: The information in this report that relates directly to the Updated Scoping Study report was compiled by Mr. Roger Mason, a Competent person who is a Member of The Australasian Institute of Mining and Metallurgy. Mr. Mason is employed as Managing Director of Antipa Minerals Ltd and has sufficient experience in the development of gold projects from the studies phase to the operational phase and consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Competent Persons Statement – 2022 Scoping Study for the Minyari Dome Project: The information in this document that relates to the 2022 Scoping Study for the Minyari Dome Project is extracted from the report entitled "Strong Minyari Dome Scoping Study Outcomes" reported on 31 August 2022, which is available to view on www.antipaminerals.com.au and www.asx.com.au. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

Gold Metal Equivalent Information - Minyari Dome Project Mineral Resource Gold Equivalent reporting cut-off grade:

The 0.4 g/t and 1.5 g/t Aueq cut-off grades assume open pit and underground mining, respectively.

A gold equivalent grade (**Aueq**) has been calculated from individual gold, copper, silver and cobalt grades. This equivalent grade has been calculated and declared in accordance with Clause 50 of the JORC Code (2012) that it is the Company's opinion that all metals included in this metal equivalent calculation have reasonable potential to be recovered and sold, using the following parameters:

- The metal prices used for the calculation are as follows:
  - US$ 2,030 /oz gold
  - US$ 4.06 /lb copper
  - US$ 24.50 /oz silver
  - US$ 49,701 per tonne cobalt
- An exchange rate (A$:US$) of 0.700 was assumed.
- Metallurgical recoveries for by-product metals, based upon Antipa test-work in 2017 and 2018, are assumed as follows:
  - Gold = 88.0% Copper = 85.0%, Silver = 85%, Cobalt = 68%
- A factor of 105% (as with the previous estimate) has been applied to the recoveries for gold, copper and silver to accommodate further optimisation of metallurgical performance. Antipa believes that this is appropriate, given the preliminary status of the recovery test-work.
- The gold equivalent formula, based upon the above commodity prices, exchange rate and recoveries, is thus:
  - **Aueq** = (Au g/t) + (Ag g/t * 0.012) + (Cu % * 1.32) + (Co % * 5.88)

Gold Metal Equivalent Information - Calibre MRE Gold Equivalent reporting cut-off grade and Gold Equivalent grade:

A gold equivalent grade (Aueq) has been calculated from individual gold, copper and silver grades. This equivalent grade has been calculated and declared in accordance with Paragraph 50 of the JORC Code that it is the Company's opinion that all metals included in this metal equivalent calculation have reasonable potential to be recovered and sold, using the following parameters:

- The metal prices used for the calculation are as follows:
  - US$ 2,030 /oz gold
  - US$ 4.06 /lb copper
  - US$ 24.50 /oz silver
- An exchange rate (A$:US$) of 0.700 was assumed.
- Metallurgical recoveries, based upon Antipa test-work in 2014, are assumed as follows:
  - Gold = 84.5%, Copper = 90.0%, Silver = 85.4%
- A factor of 105% (as with the previous estimate) has been applied to the recoveries for gold, copper and silver to accommodate further optimisation of metallurgical performance. Antipa believes that this is appropriate, given the preliminary status of the recovery test-work.
- Tungsten has not been estimated and does not contribute to the equivalent formula.
- The gold equivalent formula, based upon the above commodity prices, exchange rate, recoveries, and using individual metal grades provided by the Citadel Project Mineral Resource Estimate table, is thus:
  - **Aueq =** Au (g/t) + (1.46*Cu%) + (0.012*Ag g/t)

Gold Metal Equivalent Information - Magnum MRE Gold Equivalent reporting cut-off grade:

A gold equivalent grade (**Aueq**) has been calculated from individual gold, copper, silver and tungsten grades. This equivalent grade has been calculated and declared in accordance with Paragraph 50 of the JORC Code that it is the Company's opinion that all metals included in this metal equivalent calculation have reasonable potential to be recovered and sold, using the following parameters:

- The metal prices used for the calculation are as follows:
  - US$ 1,227 /oz gold
  - US$ 2.62 /lb copper
  - US$ 16.97 /oz silver
  - US$ 28,000 /t WO_3 concentrate
- An exchange rate (A$:US$) of 0.778 was assumed.
- Metallurgical recoveries, based upon Antipa test-work in 2014, are assumed as follows:
  - Gold = 84.5%, Copper = 90.0%, Silver = 85.4% and W = 50.0%
- A factor of 105% (as with the previous estimate) has been applied to the recoveries for gold, copper and silver to accommodate further optimisation of metallurgical performance. Antipa believes that this is appropriate, given the preliminary status of the recovery test-work.
- Note that the tungsten recovery of 50% is considered indicative at this preliminary stage based on the initial metallurgical findings.
- Conversion of W% to WO_3% grade requires division of W% by 0.804.
- The gold equivalent formula, based upon the above commodity prices, exchange rate, and recoveries, is thus:
  - **Aueq =** (Au (g/t) x 0.845) + ((%Cu x (74.32/50.69) x 0.90)) + ((Ag (g/t) x (0.70/50.69) x 0.854)) + ((%W/0.804 x (359.80/50.69) x 0.50))

ANTIPA MINERALS LTD – MINYARI DOME PROJECT SCOPING STUDY UPDATE – OCTOBER 2024

JORC Table 1 - Section 4 – Consideration of Modifying Factors (in the form of section 4 of the JORC Code (2012) Table 1)

Criteria	JORC Code Explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• *Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.* • *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.*	• The Mineral Resource Estimate (**MRE**) on which the Scoping Study Update is based was separately announced on the 17th September 2024 (**2024 MRE**) (https://antipaminerals.com.au/upload/documents/investors/asx-announcements/240917014026_24-09-17-AntipaMediaRelease-MDPMRE.pdf). • No Ore Reserve has been declared as part of the Scoping Study Update.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• Site visit information and commentary pertaining to the MRE are provided in the 2024 MRE report.
Study status	• *The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.* • *The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.*	• The type and level of study is a Scoping Study as defined in Section 38 of the JORC Code, 2012 edition. • No Ore Reserve has been declared as part of the Scoping Study Update. • The Scoping Study Update has not been used to convert Mineral Resources to Ore Reserves. • Material modifying factors have been considered in the Scoping Study Update.
Cut-off parameters	• *The basis of the cut-off grade(s) or quality parameters applied.*	• Cut-off grade parameters for the MRE are provided in the 2024 MRE report. • For the Scoping Study Update the following inputs were used to estimate revenue per ounce of gold and silver produced: ○ Gold: US$2,100 per troy ounce; ○ Silver: US$24.50 per troy ounce; ○ US$/AU$ currency exchange rate of 0.700; ○ Standard Western Australia (**WA**) State Royalties for gold and silver;

Criteria	JORC Code Explanation	Commentary
		◦ A 1% Net Smelter Royalty for gold and silver payable to Sandstorm Gold Ltd; and ◦ Relevant metallurgical recoveries for gold and silver. • For the Scoping Study Update the following inputs were used to estimate operating cost per tonne of ore treated for Open Pit and Underground Mining methods: ◦ Mining operating costs; and ◦ Processing operating costs to final saleable products (including refining costs).
Mining factors or assumptions	• *The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).* • *The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.* • *The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.* • *The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).* • *The mining dilution factors used.* • *The mining recovery factors used.* • *Any minimum mining widths used.* • *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.* • *The infrastructure requirements of the selected mining methods.*	• The Scoping Study Update has not undertaken a conversion of the Mineral Resource to an Ore Reserve. • Open Pit and Underground mining methods are utilised in the Scoping Study Update. <u>Open Pit</u> • Open pit optimisation was completed by Snowden Optiro using Datamine Studio NPVS software, which uses the Lerch-Grossman algorithm to determine a range of optimal pit-shells. • The optimal pit-shells derived were then used as a guide to develop open pit mine plans for the ore deposits. • Intermediate open pit stages were designed to defer waste pre-strip. • Open Pit studies used geotechnical parameters recommended and provided from the geotechnical study completed by Snowden Optiro (refer to Appendix A Section 6 in this report for details of the geotechnical parameter assumptions).

Criteria	JORC Code Explanation	Commentary
		Underground • Stope optimisations were run using the Datamine software Mineable Shape Optimiser® (**MSO®**). • The proposed mining method is a modified sub-level caving (**M-SLC**) technique. • Underground optimisation studies used geotechnical parameters recommended and provided from the geotechnical study completed by Snowden Optiro. Mining Factors • The Minyari (including Minyari South), WACA and GEO-01 Mineral Resource (block) models were re-blocked to simulate mining factors for dilution and recovery and provide the selective mining unit (**SMU**). • The Minyari (including Minyari South), WACA and GEO-01 Mineral Resource (block) models were re-blocked to simulate mining factors for dilution and recovery and provide the selective mining unit (SMU). • Minyari was reblocked to 5.0 mX by 5.0 mY by 5.0 mZ resulting in 12.1% dilution and 94.5% mining recovery. • WACA was modelled using MSO dig blocks for the open pit with 5.0 mZ, Min width of 2m and 0.5m skin dilution. • GEO-01 was reblocked to 5.0 mX by 5.0 mY by 5.0 mZ resulting in 0.9% dilution and 73.7% mining recovery. • All underground MSOs include 1.0m of internal dilution, in addition to the 5% external dilution, with 90.0% mining recovery (i.e. ore loss set at 10%). • A minimum mining width (true width) of 4m at Minyari was used for Underground MSO parameters.

Criteria	JORC Code Explanation	Commentary
		Inferred Mineral Resource Utilisation • 95% of the Scoping Study Update gold ounces come from the Minyari Deposit open pit and underground, with 3% from the GEO-01 open pit and 2% from the WACA open pit. • Approximately 17% of Inferred Mineral Resource has been included in the Scoping Study Update Mining Inventory. • Mineral Resource tonnage scheduled for extraction during the Scoping Study Update's 10-year production plan constitute approximately 83% Indicated and 17% Inferred. • In the first four years of operation Indicated Resource and Inferred Resource tonnage comprises 87% and 13% of the production schedule, respectively. • The post-tax payback of approximately 2.0 years from first production is dominated by Indicated Resource (83%). Infrastructure requirements • Infrastructure requirements for each mining method have been considered in the Scoping Study Update, which include but are not limited to, a suitable waste-rock landform (**WRL**), ROM pad, underground decline and ventilation, de-watering pumping requirements, Fly-in fly-out (**FIFO**) camp, airstrip, access road, etc.
Metallurgical factors or assumptions	• *The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.* • *Whether the metallurgical process is well-tested technology or novel in nature.* • *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.* • *Any assumptions or allowances made for deleterious elements.*	• The metallurgical process proposed is a conventional Carbon in Leach (**CIL**) process used to produce gold doré. • The process includes crushing, milling, leaching, gravity circuit and tailings dewatering. • The metallurgical data pertaining to the Minyari and WACA deposits has been determined by metallurgical test-work completed in 2017 and 2018 by independent consultants Strategic Metallurgy, which has been previously reported (https://antipaminerals.com.au/upload/documents/investors/asx-announcements/201129223150_2017-06-13-31.pdf and

<table>
<tr><th>Criteria</th><th>JORC Code Explanation</th><th>Commentary</th></tr>
<tr><td></td><td>The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.
For minerals that are defined by a specification, has the Ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?</td><td>https://antipaminerals.com.au/upload/documents/investors/asx-announcements/201129232007_2018-08-271.pdf).
Individual recoveries are applied to metallurgical domains for oxide, transitional and primary ore types; noting that Primary ore accounts for 70% of the Scoping Study Update mined tonnes.
Metallurgical testwork (completed by independent consultants Strategic Metallurgy) at GEO-01 is at a preliminary stage. The test work showed that reduced cyanide consumption by up to 42% compared to Minyari primary ore results in a decrease in processing cost for GEO-01 ore by 16%.
<table><tr><th>Metallurgical Domain</th><th>Recovery (%)</th></tr><tr><td>Oxide</td><td>95%</td></tr><tr><td>Transitional</td><td>92%</td></tr><tr><td>Primary</td><td>89%</td></tr><tr><td>Primary GEO-01</td><td>89.5%</td></tr></table>
The deleterious element arsenic is present as the sulphide mineral arsenopyrite.
Metallurgical test-work has shown that for the Scoping Study Update’s CIL processing Base Case the arsenic reports to the tails and therefore does not attract a refining penalty.
Scanning Electron Microscopy / Energy Dispersive X-Ray Spectroscopy (SEM/EDS) and optical microscope petrological and mineralogical studies completed between 2016 and 2021 analysing sulphides (including arsenopyrite) confirmed that the gold mineralisation was non-refractory.
Bulk sample ± pilot test-work will be undertaken as part of a Pre-Feasibility Study.
No Ore Reserve has been declared.</td></tr>
</table>

Criteria	JORC Code Explanation	Commentary
Environmental	• *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.*	• Desktop Environmental, Hydrology and Hydrogeology studies completed in 2023 to outline current status and requirements for a Pre-Feasibility Study. • Site pilot Subterranean Fauna Study and Baseline Flora and Fauna Study completed in 2024 to assess scope for additional studies required during a Pre-Feasibility Study. • Scoping Study level of analysis and these aspects of the Project will be fully addressed during the Pre-Feasibility Study. • The environmental approvals process will commence during the Pre-Feasibility Study.
Infrastructure	• *The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.*	• Limited infrastructure exists; however, there is sufficient land area available for all mining and processing related infrastructure. • No known impediments to the potential Project's infrastructure exist. • Scoping Study level of analysis and these aspects of the Project will be fully addressed during the Pre-Feasibility Study.

Costs	• *The derivation of, or assumptions made, regarding projected capital costs in the study.*
	• *The methodology used to estimate operating costs.*
	• *Allowances made for the content of deleterious elements.*
	• *The source of exchange rates used in the study.*
	• *Derivation of transportation charges.*
	• *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.*
	• *The allowances made for royalties payable, both Government and private.*
		• Estimates are at Scoping Study accuracy level i.e. ± 35%.
		• Mining Capital cost estimates were determined by Snowden Optiro (refer to Section 8.3 of the Scoping Study Update report).
		• Processing Capital cost estimates were determined by Strategic Metallurgy (refer to Sections 5 and 8.3 of the Scoping Study Update report).
		• Capital cost estimates include (but are not limited to) the following:
		  ○ Open pit capital (mine establishment costs, mobilisation, site, facilities, etc).
		  ○ Underground capital (development, ventilation, de-watering, power, etc).

Criteria	JORC Code Explanation	Commentary
		○ Site capital (CIL Processing plant, Tailings Storage Facility (**TSF**), etc). • Mining Operating cost estimates were determined by Snowden Optiro (refer to Sections 7 and 8 of the Scoping Study Update report). • Processing Operating cost estimates were determined by Strategic Metallurgy (refer to Sections 5 of the Scoping Study Update report). • Presence of deleterious element Arsenic discussed in '*Metallurgical factors or assumptions*' criteria section above. • The gold and silver price and currency exchange rate assumptions used in the Scoping Study Update are based off the long-term analyst consensus data (refer to Section 8.5 of the Scoping Study Update report). • All standard WA state royalties applicable to the Project have been allowed for, with the addition of a 1% Net Smelter Royalty payable to Sandstorm Gold Ltd upon the sale of all metals on exploration licence E45/3919 (refer to Section 8.4.3 of the Scoping Study Update report).
Revenue factors	• *The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.* • *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.*	• The derivation of feed grades comes from the re-blocked (SMU including mining dilution and mining recovery) 2024 MRE. • Mill feed streams were allocated to Low, Medium and High grade ore stockpiles based on gold grade bins to optimise expected mill head grade. • Metal prices and the currency exchange rate are based on long-term consensus. • The product to be sold is gold doré produced on site and to be sold on the spot market.

<table>
<tr><th>Criteria</th><th>JORC Code Explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Item</th><th>Unit</th><th>Au</th><th>Ag</th></tr>
<tr><td>Price</td><td>US$/Oz</td><td>2,100</td><td>24.50</td></tr>
<tr><td>Payability</td><td>%</td><td>99.9</td><td>99.9</td></tr>
<tr><td>Royalty</td><td>%</td><td>3.5</td><td>3.5</td></tr>
<tr><td>Exchange Rate</td><td>US$/AU$</td><td colspan="2">0.700</td></tr>
</table>

</td></tr>
<tr><td>Market assessment</td><td>The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.
A customer and competitor analysis along with the identification of likely market windows for the product.
Price and volume forecasts and the basis for these forecasts.
For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.</td><td>Not applicable - The product to be sold is gold doré produced on site and to be sold on the spot market.
Not applicable.
Not applicable.
Not applicable.</td></tr>
<tr><td>Economic</td><td>The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.
NPV ranges and sensitivity to variations in the significant assumptions and inputs.</td><td>Refer to Section 8 of the Scoping Study Update report.
The Scoping Study Update accuracy is ± 35%.
Based on long-term consensus a discount rate of 7% has been used in the cash flow model.
Sensitivity analysis has been completed as part of the Scoping Study Update ± 10% to ± 50% to demonstrate the effect on NPV.
The Project returned a positive NPV for ±30% variances in the significant assumptions and inputs.</td></tr>
<tr><td>Social</td><td>The status of agreements with key stakeholders and matters leading to social licence to operate.</td><td>The traditional landowners, the Martu people and the Jamukurnu-Yapalikunu Aboriginal Corporation (JYAC), are key Project stakeholders. The Martu hold exclusive possession Native Title rights and interests over more than 130,000km^2 of land, including to all points around the Minyari Dome Project area.
A Land Access and Mineral Exploration Agreement between Antipa Resources Pty Ltd, a wholly owned</td></tr>
</table>

Criteria	JORC Code Explanation	Commentary
		subsidiary of Antipa Minerals Ltd (**Antipa**), and JYAC, entitled the "North Telfer Project", was signed on 26 July 2015 which grants Antipa access and the ability to conduct exploration activities on the Minyari Dome Project, including Exploration Licence E45/3919 which contains the 2024 MRE (i.e. Minyari, GEO-01, WACA, Sundown, Minyari South, Minyari North and other satellite deposits/prospects).
Other	• *To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:* • *Any identified material naturally occurring risks.* • *The status of material legal agreements and marketing arrangements.* • *The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.*	• No Ore Reserve has been declared. • No material naturally occurring risks have been identified. • The Project is owned 100% by Antipa Minerals and there are no marketing arrangements in place. • There are currently no government (mining) agreements in place. • The 2024 MRE is located wholly within Antipa's 100% owned 15 graticular blocks covering the northernmost region of exploration licence E45/3919. • Antipa continues to undertake relevant studies to support necessary stakeholder approvals processes; including the WA Government, Native Title/Traditional Owners, etc. • There are reasonable grounds to expect that all necessary WA Government approvals will be obtained within the timeframe anticipated. • Antipa is yet to commence Pre-Feasibility or Feasibility studies.
Classification	• *The basis for the classification of the Ore Reserves into varying confidence categories.* • *Whether the result appropriately reflects the Competent Person's view of the deposit.* • *The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).*	• No Ore Reserve has been declared.

Criteria	JORC Code Explanation	Commentary
Audits or reviews	• *The results of any audits or reviews of Ore Reserve estimates.*	• No Ore Reserve has been declared.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.* • *It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• No Ore Reserve has been declared.

MINYARI DOME PROJECT SCOPING STUDY UPDATE

APPENDIX A

ANTIPAMINERALS

MINYARI DOME PROJECT

Scoping Study Update 2024

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1 EXECUTIVE SUMMARY

Antipa Minerals Limited (**Antipa** or **the Company**) is an Australian-based minerals exploration company listed on the Australian Securities Exchange (ASX: **AZY**). Exploration activities are focused on the Minyari, WACA and satellite deposits within Antipa's 100%-owned Minyari Dome Project (the Project) located in the Paterson Province in Western Australia (Figure 2.1).

1.1 Methodology

Antipa engaged Snowden Optiro to undertake a Scoping Study Update (the **Study**) in order to progress the understanding of the Project development pathway. The Study considered only Indicated and Inferred Mineral Resources in the evaluation and costing (there is no Measured Mineral Resource). Unclassified material was treated as waste.

Open pit optimisations were used to evaluate options for open pit extraction. An underground extension using stope optimisation outlines, truncated to the limits of the open pits, was appended to the result to create a combined open pit-underground mining result.

Open pit mining operations would be planned around a fleet of 300-tonne class excavators paired with 200-tonne dump trucks. Ore will be transported to the run-of-mine (ROM) pad via a haul road, and waste rock will be hauled to a local waste dump adjacent to the Minyari pit.

The terms gold equivalent (Aueq) and net smelter return (NSR) are used in this report where:

- Aueq (g/t) = Au grade (g/t) + 0.012 Ag grade (g/t).
- NSR ($) = (82.8 x Au g/t) + (1 x Ag g/t).

A range of throughput rates; 1.0 million tonnes per year (Mtpa), 2.0 Mtpa and 3.0 Mtpa were tested. Antipa engaged Strategic Metallurgy as the Study metallurgical consultant to develop two processing options:

- CIL - A free milling gold and silver recovery flowsheet.
- Flotation - A base metal recovery flowsheet for separate copper-gold-silver and cobalt concentrates.

Scenario 3, which is the 3.0 Mtpa throughput via the CIL was selected as the preferred scenario to take forward for the following reasons:

- It provides one of the highest DCF values and is within 3% of the maximum value of all scenarios.
- It has a lower risk of implementation, with the underground mine commencing in Year 4.
- It has the highest IRR and shortest payback period.
- It has the highest undiscounted value option, regardless of processing method (CIL or flotation).

A summary of the financial results for Scenario 3 (CIL) are:

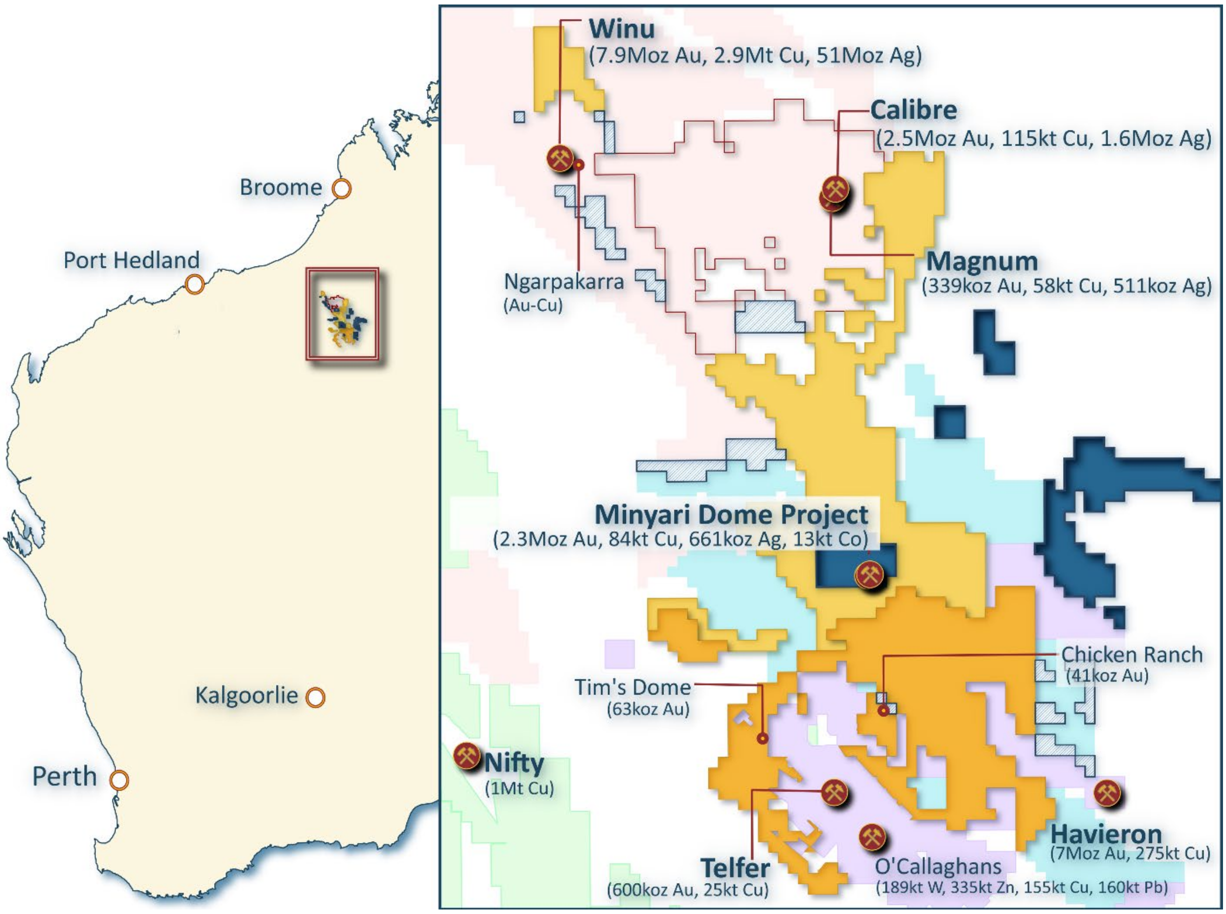
- A LOM of eleven years.
- 30.2 Mt at 1.52 g/t Au and 0.48 g/t Ag and 1.5 Moz gold and 500 koz silver processed.
- An AISC of A$1,722/oz or US$1,205/oz (excluding Y0 pre-production open pit mining).
- A DCF of $834 million pre-tax and $598 million post-tax.
- An IRR of 52% pre-tax and 46% post-tax.
- A short payback period of 2 years post preproduction, and a maximum cash drawdown of $306 million (on an annualised cash flow basis).

2 Introduction

2.1 Project location

The Project is located in the Paterson Province of Western Australia (Figure 2.1), 35 km north of Newmont's (soon to be Greatland Gold plc's[1]) Telfer gold-copper-silver mine and 22 Mtpa mineral processing facility, 450 km east of the regional hub of Port Hedland (a 6-hour drive) and 1,700 km northeast of Perth (about a 20-hour drive). The closest town is Marble Bar, approximately 280 km west of the project area.

Figure 2.1 Minyari Project location



Source: Antipa

Existing infrastructure capable of servicing the Project includes:

- Bitumen roads from Port Hedland (population c. 14,000) to the Telfer Mine Access Road turnoff, via Marble Bar (population c. 410).
- Gravel roads including Telfer Mine Access Road and Punmu Community Road.
- Final access from Telfer to site is via well maintained local tracks.
- The Telfer Mine gas pipeline (owned by Energy Infrastructure Investments and operated by APA Group), which includes the Nifty Mine Gas Lateral.
- Planned Asian Renewable Energy Hub (AREH), which aims to generate up to 26GW of combined solar and wind power capacity, plus 1.6 million tonnes of green hydrogen production annually.
- Port Hedland port, a bulk import and export facility.
- The Port Hedland domestic and international airport, and mine-site (bitumen) airstrips at Telfer (about 35 km) and Nifty (about 100 km).

[1] Refer to Greatland Gold plc AIM release dated 14 October 2024, "Acquisition of Havieron & Telfer – Update".

The Martu People hold Native Title Rights over the Project area with the Aboriginal communities of Punmu and Kunawarritji located approximately 120 km and 300 km to the east, respectively.

2.2 Tenement status

The Project is 100%-owned by Antipa and covers an area of 878.4 km2 over seven Granted and nineteen Pending West Australian Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) mineral Exploration Licences. Three of these granted mineral Exploration Licences comprise the Minyari Dome 'Resource Area':

- E45/3919 (partial area – refer to below), which the Minyari, GEO-01, WACA, Sundown, Minyari south, Minyari North and WACA West Mineral Resources are contained wholly within.
- E45/3918 (partial area – refer to below).
- E45/4618 (100%).

Two of the Exploration Licences are divided between the 100% Antipa owned Minyari Dome Project and the Wilki Project Farm-In Agreement (E45/3919) with Newmont, and the Paterson Project Farm-In Agreement (E45/3918) with IGO:

- E45/3919:
  - 66 total graticular blocks in total
  - 15 graticular blocks within the 100% Antipa owned Minyari Dome Project
  - 51 non-contiguous graticular blocks as part of the Wilki Project Farm-In Agreement with Newcrest.
- E45/3918:
  - 91 total graticular blocks in total
  - 29 graticular blocks within the 100% Antipa owned Minyari Dome Project
  - 72 contiguous graticular blocks as part of the Paterson Project Farm-In Agreement with IGO.

3 Geology and Mineral Resource

Snowden Optiro was engaged by Antipa to complete a Mineral Resource estimate (**MRE**) update for the Minyari, GEO-01 and WACA group of gold-copper-silver-cobalt deposits. The MRE update was reported in August 2024.

The deposits are located within the Proterozoic-aged Paterson Province and precious (gold and silver) and/or base metal (copper and cobalt) mineralisation in the region is interpreted to be reduced intrusion-related, with local controls on mineralisation being the key factors influencing mineralisation grade and continuity.

3.1 Local geology

Gold and silver, and/or base metal (copper and cobalt) mineralisation at the Minyari Dome Project deposits is hosted predominantly within hydrothermally altered meta-sediments. There are several mafic bodies identified in the project area, predominantly dolerite, which are variably mineralised, along with late felsic intrusive dykes that crosscut the deposit area, apparently postdating the mineralisation. The Proterozoic rocks are overlain by transported overburden, typically desert/dune aeolian sand which varies in thickness up to 10 m. At GEO-01 a 10 m deep, on average, clay zone of depletion is present within the oxide regolith horizon.

Mineralisation is interpreted to be reduced intrusion-related, with local controls on mineralisation related to variations in both the competency/hardness and chemical composition of rock units, in combination with other discrete structural controls such folding, faulting, fracturing, veining, brecciation and associated hydrothermal alteration and mineralisation (including sulphides) being the key factors influencing mineralisation grade and continuity.

The Minyari deposit constitutes approximately 80% of the gold resource and 95% of the Scoping Study Update mining inventory gold ounces. Minyari mineralisation is generally moderate to steeply dipping and is hosted by a plunging pipe-like breccia body located in the hinge and both limbs of an interpreted synform. The true thickness of mineralisation ranges from 5 m to 120 m and extends from surface to a depth of 670 m and remains open down plunge to the northwest. In the Minyari deposit area, there is also near- surface, sub-horizontal soil/calcrete hosted re-worked/remobilised “channel” style low-grade gold mineralisation, located above the Proterozoic basement.

3.2 Data quality

Data quality in the project areas is considered by Snowden Optiro to be of a good standard. The significant number of drillholes completed by Antipa and used for MRE follows industry best practice standards.

3.3 Mineral Resource Estimation

Antipa prepared the mineralisation, weathering and lithology interpretations which were inputs to the estimates. The interpretations were used to flag drill hole samples, from which 1.0 m (downhole) composites were created and were used for estimation. Top cuts were applied to data, where required, to restrict the influence of outlier data.

All boundaries were treated as hard for the purposes of estimation, except for a semi-soft boundary surrounding the Minyari Main zone. Ordinary Kriging was selected as the preferred estimation technique based on the low variance/coefficient of variation, low nugget continuity, and minimal skew exhibited in the respective grade distributions. Variography was prepared for all variables using the data from single or combined domains, depending on the number of samples. A three-pass search strategy was utilised in each estimate. Parent cell estimates were applied. At the Minyari deposit, the estimate was depleted for minor previous metallurgical sampling excavations. The MREs have been classified in accordance with the JORC Code (2012) reporting guidelines. There is sufficient confidence in the data quality to support all classifications. The final MRE classification employed the available drilling and confidence in the estimate to assign a classification as Indicated or Inferred Mineral Resources.

The 2024 Mineral Resource update reported for Minyari (Table 3.1), GEO-01 (Table 3.2), Minyari South (Table 3.3), Sundown (Table 3.4), WACA (Table 3.5), WACA West (Table 3.6) and Minyari North (Table 3.7). Minyari, GEO-01 and Sundown have been reported at a gold equivalent (**Aueq**) cut-off off 0.4 g/t to reflect potential open pit extraction, and above 1.5 g/t Aueq below this RL as a proxy for underground extraction (the surface RL is approximately 275 mRL). The remaining resources are reported at a Aueq cut-off off 0.4 g/t to reflect potential open pit extraction. The estimates have been classified and reported in accordance with the JORC Code (2012).

Table 3.1 Minyari MRE update, 2024 – summary

Minyari										
Resource category	**Weathering**	**Tonnes (kt)**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**Co (%)**	**Au (oz)**	**Cu (t)**	**Ag (oz)**	**Co (t)**
At a 0.4 g/t Aueq cut-off grade above the 0 mRL										
Indicated	Overburden	50	0.62	0.02	0.10	0.001	1,000	10	150	-
Inferred		8	0.52	0.01	0.06	0.001	100	1	20	-
Subtotal		58	0.61	0.02	0.09	0.001	1,100	11	170	1
Indicated	Oxide	767	1.22	0.21	0.27	0.03	30,000	2,000	6,700	300
Inferred		276	0.75	0.05	0.08	0.01	6,700	100	700	-
Subtotal		1,043	1.09	0.17	0.22	0.03	36,700	2,100	7,400	300
Indicated	Transitional	1,595	1.25	0.18	0.36	0.04	64,000	3,000	18,600	670
Inferred		485	0.89	0.06	0.13	0.01	14,000	300	2,000	100
Subtotal		2,080	1.16	0.15	0.31	0.04	78,000	3,300	20,600	770
Indicated	Fresh	14,700	1.28	0.19	0.49	0.04	707,000	33,000	267,000	7,000
Inferred		2,550	1.13	0.11	0.23	0.02	120,000	4,000	24,000	600
Subtotal		17,250	1.26	0.18	0.44	0.04	827,000	37,000	291,000	7,600
Indicated		17,120	1.28	0.19	0.49	0.04	707,000	33,000	267,000	7,000
Inferred		3,321	1.13	0.11	0.23	0.02	120,000	4,000	24,000	600
Subtotal		20,441	1.26	0.18	0.44	0.04	827,000	37,000	291,000	7,600
At a 1.5 g/t Aueq cut-off grade below the 0 mRL										
Indicated	Fresh	9,970	2.49	0.27	0.75	0.03	798,000	27,000	240,000	2,600
Inferred	Fresh	2,895	2.44	0.19	0.51	0.01	227,000	6,000	47,000	400
Subtotal		12,860	2.48	0.25	0.69	0.02	1,025,000	32,400	287,000	3,000
Total	**Minyari**	**33,300**	**1.73**	**0.21**	**0.54**	**0.03**	**1,852,000**	**68,900**	**579,000**	**10,800**

Table 3.2 GEO-01 MRE 2024 – summary

GEO-01										
Resource category	**Weathering**	**Tonnes (kt)**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**Co (%)**	**Au (oz)**	**Cu (t)**	**Ag (oz)**	**Co (t)**
At a 0.4 g/t Aueq cut-off grade above the 0 mRL										
	Overburden	0	0	0	0	0	0	0	0	0
Indicated		439	0.66	0.05	0.10	0.003	9,300	200	1,400	10
Inferred	Oxide	291	0.59	0.03	0.07	0.004	5,600	100	700	10
Subtotal		730	0.63	0.04	0.09	0.003	14,900	300	2,100	20
Indicated		1,017	0.75	0.05	0.11	0.003	24,600	500	3,500	30
Inferred	Transitional	505	0.51	0.04	0.08	0.004	8,200	200	1,400	20
Subtotal		1,522	0.67	0.04	0.10	0.003	32,800	700	4,900	50
Indicated		1,537	0.79	0.03	0.09	0.002	39,100	500	4,500	30
Inferred	Fresh	2,953	0.68	0.06	0.12	0.003	64,300	1,700	11,010	90
Subtotal		4,490	0.72	0.05	0.11	0.003	103,400	2,200	15,510	120
Indicated	0 mRL	2,990	0.76	0.04	0.10	0.003	73,000	1,200	9,400	70

Inferred		3,750	0.65	0.05	0.11	0.003	78,100	2,000	13,110	120
Subtotal		6,740	0.70	0.04	0.10	0.003	151,100	3,200	23,000	190
Total	**GEO-01**	**6,740**	**0.70**	**0.04**	**0.10**	**0.003**	**151,100**	**3,200**	**23,000**	**190**

Table 3.3 Minyari South MRE 2024 – summary

Minyari South										
Resource category	**Weathering**	**Tonnes (kt)**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**Co (%)**	**Au (oz)**	**Cu (t)**	**Ag (oz)**	**Co (t)**
At a 0.4 g/t Aueq cut-off grade above the 150 mRL										
-	Overburden	-	-	-	-	-	-	-	-	-
Inferred	Oxide	21	4.45	0.33	0.60	0.04	3,070	100	420	10
	Transitional	50	4.95	0.47	0.85	0.04	7,960	500	1,370	20
	Fresh	80	4.27	0.69	1.29	0.06	10,930	500	3,270	50
Total	**Minyari South**	**151**	**4.52**	**0.57**	**1.04**	**0.05**	**22,000**	**900**	**5,000**	**80**

Table 3.4 Sundown MRE update, 2024 – summary

Sundown										
Resource category	**Weathering**	**Tonnes (kt)**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**Co (%)**	**Au (oz)**	**Cu (t)**	**Ag (oz)**	**Co (t)**
At a 0.4 g/t Aueq cut-off grade above the 0 mRL										
-	**Overburden**	-	-	-	-	-	-	-	-	-
Indicated		27	0.85	0.12	0.24	0.06	700	30	210	20
Inferred	**Oxide**	47	1.02	0.09	0.09	0.06	1,500	40	140	30
Subtotal		**74**	**0.96**	**0.10**	**0.15**	**0.06**	**2,300**	**80**	**350**	**50**
Indicated		54	0.98	0.11	0.28	0.06	1,700	60	490	40
Inferred	**Transitional**	82	1.06	0.10	0.11	0.07	2,800	80	290	60
Subtotal		**136**	**1.03**	**0.10**	**0.18**	**0.07**	**4,500**	**140**	**770**	**100**
Indicated		361	1.40	0.30	0.61	0.02	16,200	1,080	7,110	100
Inferred	**Fresh**	558	1.99	0.15	0.26	0.06	35,600	820	4,730	340
Subtotal		**558**	**1.76**	**0.21**	**0.40**	**0.04**	**51,900**	**1,900**	**11,800**	**430**
Indicated		442	1.31	0.27	0.55	0.03	18,700	1,200	7,800	150
Inferred		687	1.81	0.14	0.23	0.06	40,000	900	5,160	430
Subtotal		**1,129**	**1.61**	**0.19**	**0.36**	**0.05**	**58,700**	**2,120**	**13,000**	**580**
At a 1.5 g/t Aueq cut-off grade below the 0 mRL										
Indicated	Fresh	-	-	-	-	-	-	-	-	-
Inferred	Fresh	141	1.96	0.24	0.44	0.04	8,900	300	2,000	60
Subtotal		**141**	**1.96**	**0.24**	**0.44**	**0.04**	**8,900**	**300**	**2,000**	**60**
Total	**Sundown**	**1,270**	**1.65**	**0.19**	**0.37**	**0.05**	**68,000**	**2,500**	**15,000**	**640**

Table 3.5 WACA MRE 2024 – summary

WACA										
Resource category	**Weathering**	**Tonnes (kt)**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**Co (%)**	**Au (oz)**	**Cu (t)**	**Ag (oz)**	**Co (t)**
At a 0.4 g/t Aueq cut-off grade above the 100 mRL										
-	Overburden	-	-	-	-	-	-	-	-	-
Indicated		231	0.78	0.08	0.14	0.02	5,750	190	920	40
Inferred	Oxide	125	0.73	0.13	0.14	0.02	2,940	170	610	20
Subtotal		**356**	**1.52**	**0.10**	**0.28**	**0.02**	**8,690**	**360**	**1,530**	**60**
Indicated		434	0.91	0.10	0.15	0.02	12,750	430	2,040	80
Inferred	Transitional	194	0.81	0.13	0.14	0.02	5,030	260	910	40
Subtotal		**628**	**1.71**	**0.11**	**0.29**	**0.02**	**17,780**	**690**	**2,960**	**120**
Indicated	Fresh	1,044	1.02	0.12	0.15	0.02	34,190	1,290	6,460	200

Inferred		1,573	0.97	0.15	0.19	0.02	49,120	2,340	7,410	300
Subtotal		**2,617**	**1.99**	**0.13**	**0.35**	**0.02**	**83,310**	**3,640**	**13,870**	**500**
Indicated		1,710	0.96	0.11	0.17	0.02	52,700	1,900	9,000	320
Inferred		1,893	0.93	0.15	0.15	0.02	57,800	2,700	9,000	350
Subtotal		**3,603**	**0.95**	**0.13**	**0.18**	**0.02**	**110,500**	**4,700**	**18,000**	**670**
At a 1.5 g/t Aueq cut-off grade below the 0 mRL										
Indicated	Fresh									
Inferred	Fresh	1,561	1.69	0.14	0.16	0.03	84,900	2,200	8,000	525
Subtotal		**1,561**	**1.69**	**0.14**	**0.16**	**0.03**	**84,900**	**2,200**	**8,000**	**525**
Total	**WACA**	**5,164**	**1.18**	**0.13**	**0.16**	**0.02**	**195,000**	**6,900**	**27,000**	**1,200**

Table 3.6 WACA West MRE 2024 – summary

WACA West										
Resource category	**Weathering**	**Tonnes (kt)**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**Co (%)**	**Au (oz)**	**Cu (t)**	**Ag (oz)**	**Co (t)**
At a 0.4 g/t Aueq cut-off grade above the 100 mRL										
Inferred	Overburden	-	-	-	-	-	-	-	-	-
	Oxide	40	0.84	0.17	0.84	0.03	1,095	70	1,090	10
	Transitional	82	0.76	0.14	0.71	0.03	2,020	120	1,890	25
	Fresh	270	0.69	0.17	0.83	0.03	6,030	470	7,230	70
	Total	**392**	**0.72**	**0.17**	**0.81**	**0.03**	**9,100**	**660**	**10,200**	**110**
At a 1.5 g/t Aueq cut-off grade below the 100 mRL										
Inferred	Fresh	10	0.87	0.50	0.04	0.01	290	50	10	1
Total		**402**	**0.73**	**0.19**	**0.79**	**0.03**	**9,400**	**700**	**10,000**	**111**

Table 3.7 Minyari North MRE 2024 – summary

Minyari North										
Resource category	**Weathering**	**Tonnes (kt)**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**Co (%)**	**Au (oz)**	**Cu (t)**	**Ag (oz)**	**Co (t)**
At a 0.4 g/t Aueq cut-off grade above the 100 mRL										
Inferred	Overburden	-	-	-	-	-	-	-	-	-
	Oxide	27	0.41	0.15	0.07	0.01	360	40	70	3
	Transitional	35	0.62	0.09	0.09	0.01	690	30	100	3
	Fresh	401	0.94	0.08	0.15	0.01	12,100	340	1,880	40
	Total	**463**	**0.88**	**0.09**	**0.14**	**0.01**	**13,000**	**410**	**2,000**	**50**
At a 1.5 g/t Aueq cut-off grade below the 100 mRL										
Inferred	Fresh	124	1.76	0.08	0.20	0.01	7,000	100	810	10
Total	**Minyari North**	**587**	**1.07**	**0.09**	**0.15**	**0.01**	**20,000**	**500**	**3,000**	**60**

4 Geotechnical

4.1 General setting

The Project's gold-silver-copper-cobalt deposits are hosted in Proterozoic basement rocks, mainly meta-sediments and meta-intrusives. At the Minyari deposit, the gold-bearing sulphide mineralisation forms a series of near-vertical lenses and shoots within a pipe-like breccia body that plunges moderately northwest. Weathering of the basement rocks extends up to approximately 70 m depth. The weathered basement rocks comprise saprolite and saprock horizons and are overlain by residual sand/soil/calcrete material, typically less than 5 m deep.

4.2 Geotechnical investigations

Geotechnical investigations have comprised:

- Geotechnical logging of diamond drill core by interval
- Rock quality designation (RQD)
- Fracture frequency
- Estimated rock strength.

Structural logging of orientated drill core:

- Alpha and beta angles
- Surface roughness/condition
- Infill mineralisation.

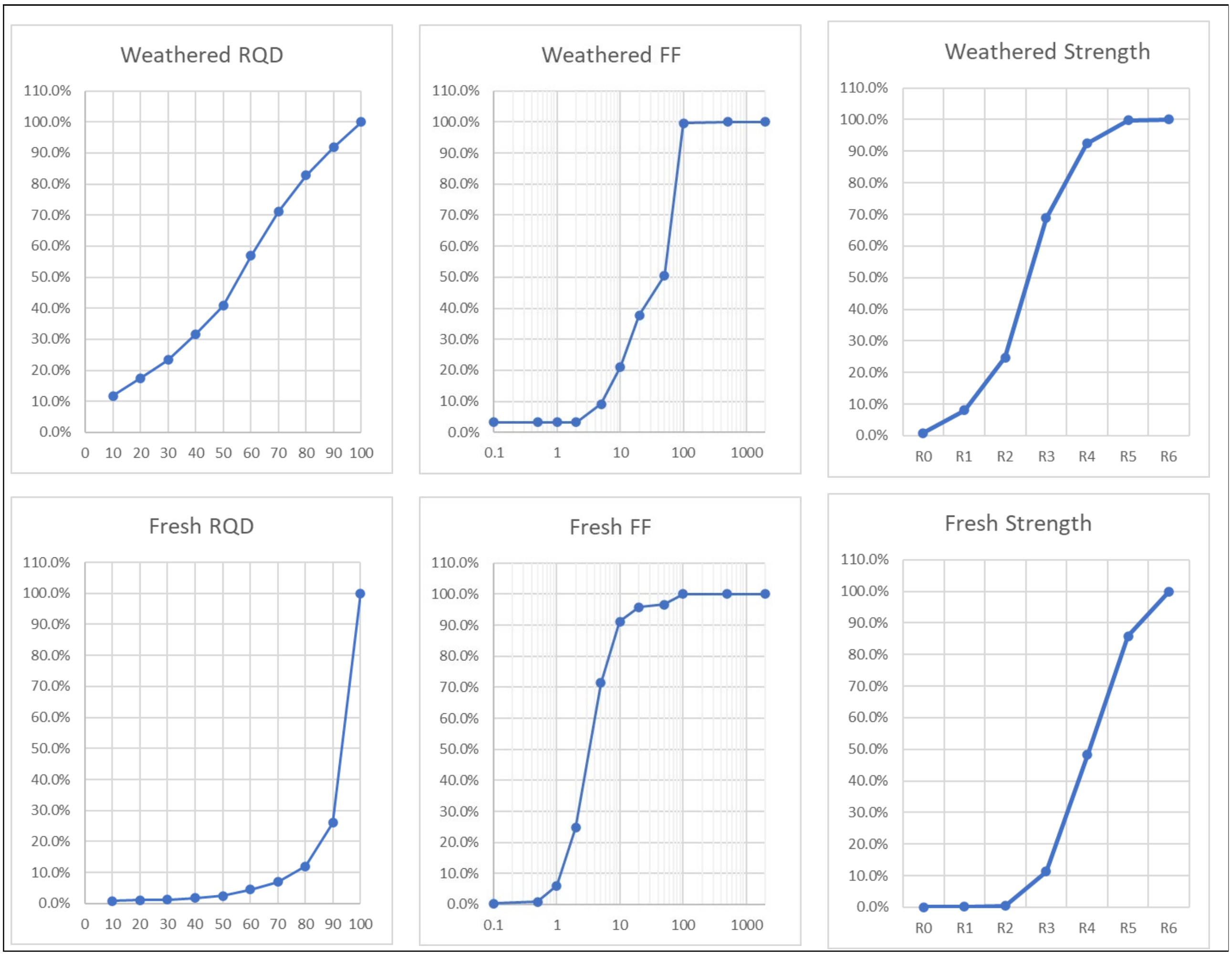
No geomechanical testwork has been undertaken.

4.3 Geotechnical model

The Minyari geotechnical model was developed with data from a set of 20 drill holes that intersected the deposit, totaling 7,322 m logged. Geotechnical and structural logging was undertaken with Antipa's in-house methodology that is not fully in line with industry standard methods for direct calculation of geotechnical classification parameters. This has necessitated some interpretation of the data by Snowden Optiro to determine typical conditions.

The preliminary Minyari geotechnical model comprises two domains (Weathered Rock and Fresh Rock). Length weighted distributions of the characterisation data are presented in Figure 4.1.

Figure 4.1 Length weighted distributions of geotechnical characterisation data



Length-weighted median values of the characteristics derived from the charts are summarised in Table 4.1.

Table 4.1 Summary of geotechnical characteristics (length weighted median values)

Domain	RQD (%)	Fracture frequency (/m)	Estimated strength (ISRM)
Weathered rock	55	50	R2/R3
Fresh rock	92	3	R4

4.3.1 Rock mass structure model

The preliminary Minyari rock mass structure model was developed with orientated logging data from a subset of the geotechnically logged holes with high confidence orientation reliability. The following stereo plots (Figure 6.3 to Figure 6.8) show the full selected dataset and sets sorted by structure type.

Figure 4.2 Minyari structure model – all structures

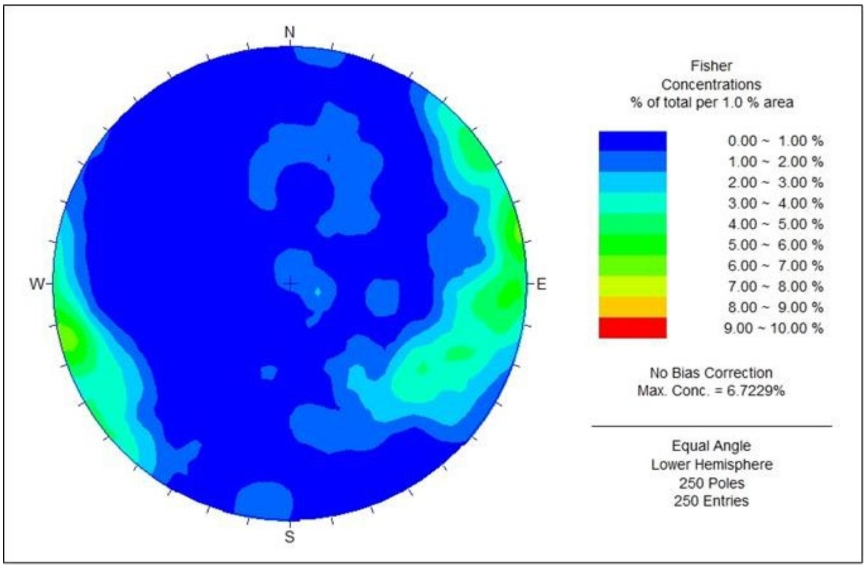


Figure 4.3 Minyari structure model – bedding

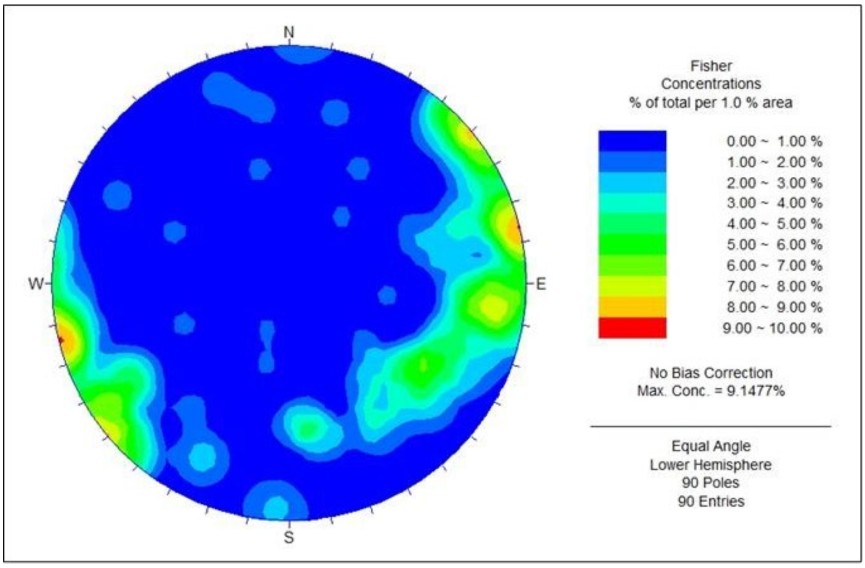


Figure 4.4 Minyari structure model – foliation

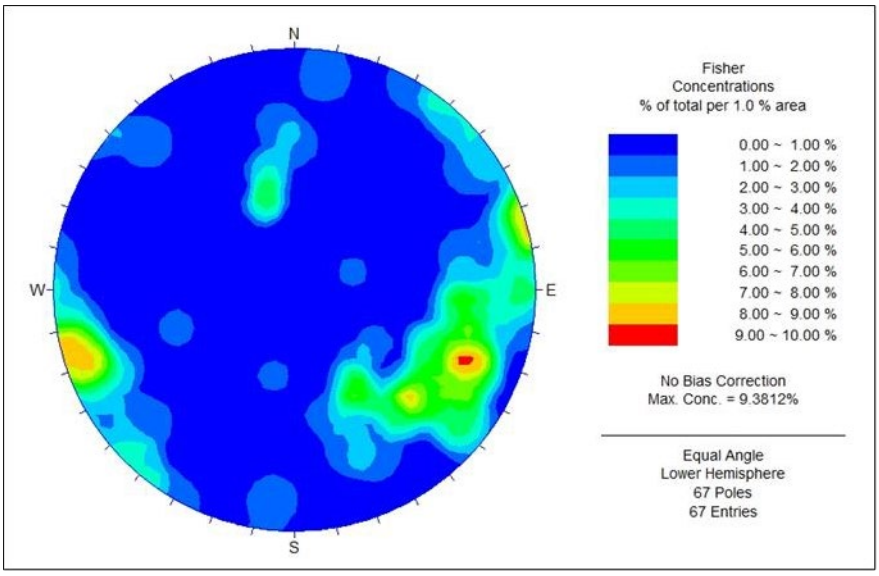


Figure 4.5 Minyari structure model – fractures

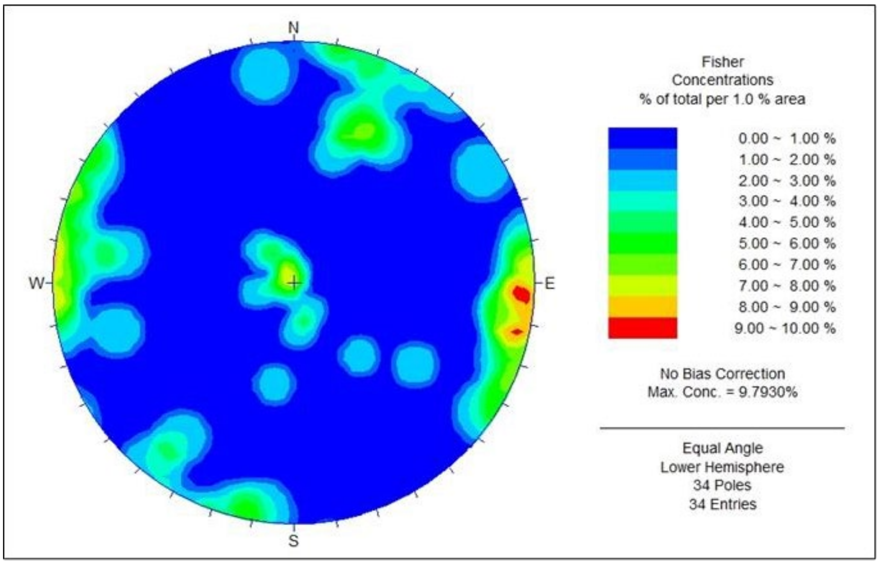


Figure 4.6 Minyari structure model – joints

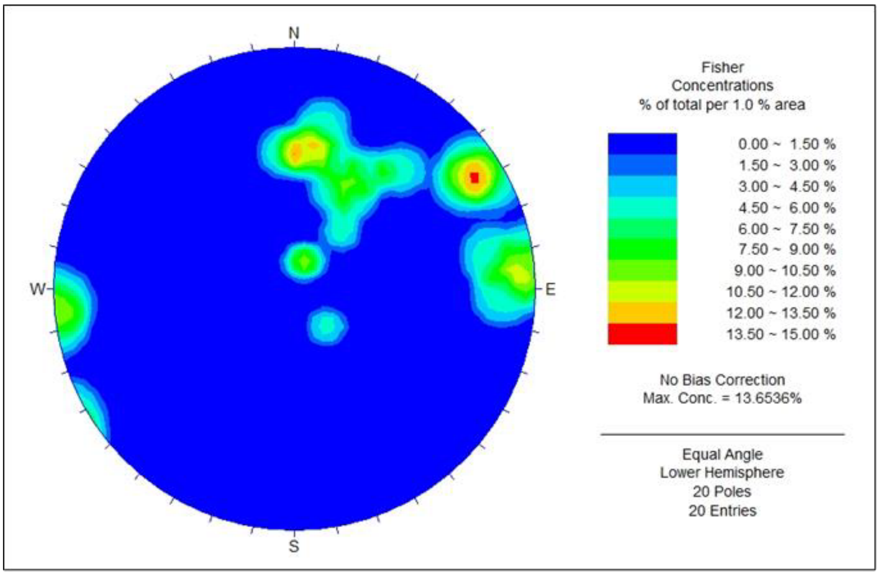
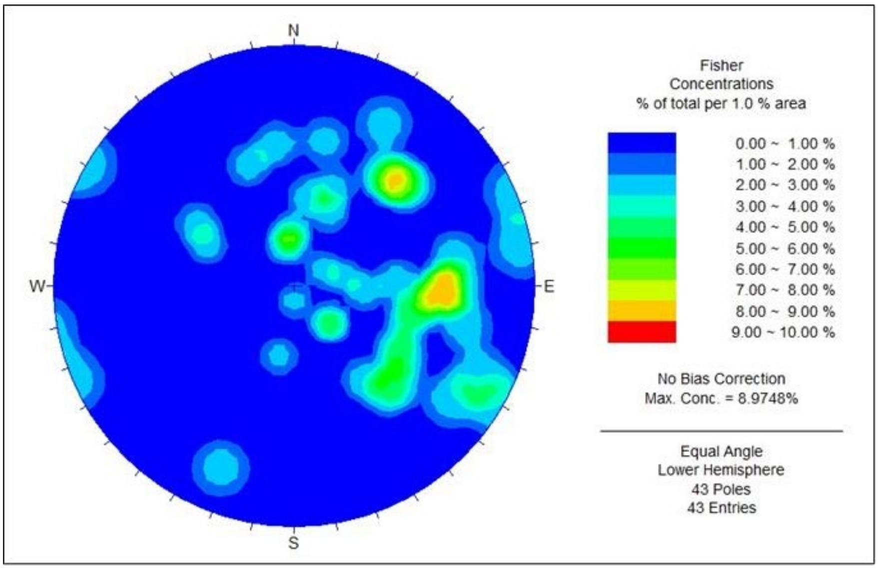


Figure 4.7 Minyari structure model – veins



The dominant structural fabric comprises bedding, foliation, joints, and veins. The dominant structural orientation is sub-vertical, trending north-northwest to south-southeast. In addition, there is a minor set of joints dipping at moderate angle to the south, plus a substantial proportion of “randomly orientated” structures.

Surface and infill characteristics recorded for the set of orientated structures are summarised in Table 4.2.

Table 4.2 Discontinuity surface and infill characteristics

Characteristics	Weathered	Fresh
Surface		
Smooth	70	439
Slightly smooth	-	9
Slightly rough	63	348
Very rough	20	70
Slicken-sided	-	33
Infill		
Slightly weathered	13	285
Highly weathered	50	51
Soft gouge <5 mm	-	33
Soft gouge >5 mm	-	8

The typical characteristics of the rock mass discontinuities are summarised in Table 4.3.

Table 4.3 Characteristics of the rock mass discontinuities

Domain	Planarity	Roughness	Infill
Weathered	Undulating/Stepped	Smooth/Rough	Moderate mins coating
Fresh	Undulating	Smooth/Rough	Hard mins coating

4.3.2 Geotechnical classification

Preliminary Geotechnical Classifications have been developed for the domains using the industry-standard methodologies:

- Rock Mass Rating (RMR89) – CSIR/Bieniawski (1989).
- GSI – Hoek (1994).
- Rock Mass Rating/Mining Rock Mass Rating – Laubscher (1990).
- NGI Tunnelling Support Index Q/Q’ – Barton et al. (1974, 1993).

The geotechnical parameters have been subject to validation by comparison of the logs with core photographs of two holes. As a result, limited adjustments were made to the parameters before calculating the classification values listed in Table 6.5, Table 6.6 and Table 6.7.

Stress conditions assumed for calculation of the underground parameters are based on the Telfer geotechnical model for a mining depth of 500 m:

- $\sigma 1 = 2 \times \sigma \times V = 2 \times 500 \times 0.027 = 27$ MPa

Table 4.4 Geotechnical classifications – RMR89 and GSI

Domain	UCS	RQD	FF	Discontinuities	Groundwater	RMR89	GSI
Weathered	R2	55	50		Assumed Dry		
Points	*2*	*11*	*1*	*14*	*15*	*43*	*38*
Fresh	R4/R5	92	3		Assumed Dry		
Points	*10*	*18*	*10*	*16*	*15*	*69*	*64*

Table 4.5 Geotechnical classifications – Laubscher RMR

Domain	UCS	FF	Discontinuities	LRMR	MRMR
Weathered	R2	50	Assumed Dry		
Points	*2*	*1*	*11.5*	*15.5*	*14*
Fresh	R4/R5	3	Assumed Dry		
Points (Open Pit)	*10*	*10*	*21.7*	*52.7*	*50*
Points (Underground)	*10*	*10*	*21.7*	*52.7*	*45*

Table 4.6 Geotechnical classifications – Laubscher RMR

Domain	RQD (median)	Jn	Jr	Ja	Q'	Jw	SRF	Q
Fresh	92	6	2	1	30.7	0.66	6	3.4
Dominant characteristics		*2+ sets*	*Undulating Smooth*	*No infill/ Hard mins*		*Damp*	*sc/s1 = 3.7*	

4.3.3 Mine design parameters

Initial assessment of the potential for open pit mining at Minyari is considering a pit design up to approximately 500 m depth. The current resource model extends below this depth for several hundred metres, providing opportunity for extraction by underground mining.

Preliminary design parameters have been developed using empirical methods for optimisation studies of open pit and underground mining of the deposit.

Open pits

Overall slope angles for open pit designs were estimated using both Sjoberg's (2000) charts based on Rock Strength Class and the Haines and Terbrugge (1991) chart based on MRMR, interpreted for a Factor of Safety of 1.2. Results are summarised in Table 4.7.

Table 4.7 Overall slope angles

Domain	Maximum slope height	Overall slope angle	
		Sjoberg	Haines and Terbrugge
Weathered	70 m		40°
Fresh	250 m	50°	40°
	500 m	45°	

The overall slope angle assessed from the empirical design charts (highlighted) are recommended for scoping-level optimisation studies.

Underground

The rock mass quality defined by the geotechnical classifications summarised in Section 6.3 indicates typical underground ground conditions are in the "Good" category. For these conditions, appropriate underground mining methods below an open pit include sublevel open stoping and sublevel caving.

Preliminary open stope design parameters have been developed using the empirical Stability Chart methodology (Mathews et al., 1980; Potvin et al., 1989; Mawdesley and Trueman, 2006). The input properties and calculation of the Stability Number N' and hydraulic radius for nominal 500 m depth are summarised in Table 4.8.

Table 4.8 Stability chart assessment of stope design parameters

Parameter	Condition	Backs	Walls
Q’	Median	30.7	30.7
A	sc/s1 = 3.7	0.2	0.2
B	Bedding; sub-vertical	1.0	0.3
C	Surface orientation	2.0	8.0
N’		12.3	14.7
Hydraulic radius (Mathews)	Unsupported	7	7.5
	Supported	12	12.5
Hydraulic radius (Mawdesley)	Unsupported	10	11
Maximum stope design dimensions (Mathews)	Unsupported	28 x 28	30 x 30
	Supported	48 x 48	50 x 50

The stope dimensions estimated using Mathews effectively limit overbreak (ELOS) to approximately 0.5 m. Larger stope dimensions may be achievable if the allowable ELOS is increased to 1.0 m (Table 4.9), derived from Clark and Pakalnis (1997).

Table 4.9 Hydraulic radius for ELOS of 1.0 m

Stope surface	N’	Hydraulic radius (ELOS = 1.0 m)
Back	12.3	10
Walls	14.7	11

The hydraulic radius values determined with the Mawdesley method agree with those in Table 4.9 and confirm stopes with spans and heights of 30 m will have a high degree of stability. The assessments summarised in Table 4.8 and Table 4.9 indicate large-scale open stoping is feasible with primary/secondary extraction sequencing and a sublevel interval up to 30 m. Double-lift stopes may also be feasible in areas where geotechnical conditions are better than the median (e.g. stope walls with 25 m span x 50 m height have a hydraulic radius of 8.3).

The median Q value of 3.4 indicates underground mine development will largely be within the Poor rock support class, mainly due to the depth/stress conditions. The development will require support comprising systematic rock-bolting (2.4 m bolts at 1.3 m spacing) with 50 mm FRC or steel mesh.

4.3.4 Findings and recommendations

Geotechnical conditions at Minyari comprise:

- A Weathered Rock domain up to 70 m deep including saprolite and saprock horizons.
- A Fresh Rock domain.
- The Weathered Rock domain comprises very low to low strength, highly fractured material, classified as Very Poor.
- The Fresh Rock domain comprises high to very high strength, low to moderately fractured material, classified as Good.
- Current geotechnical and structural logging databases are substantial and sufficient for scoping study level.

Recommended mine design parameters for open pit and underground operations based on a preliminary assessment of geotechnical conditions are summarised in Table 4.10.

Table 4.10 Summary of mine design recommendations

Item	Properties	Depth	Parameter
Open pit slope angles	Weathered	70 m	40°
	Fresh	250 m	50°
		500 m	45°
Open stope dimensions	Back		25 m x 25 m
	Height		30 m

Underground mine development will require support comprising systematic rock-bolting (2.4 m bolts at 1.3 m spacing) with 50 mm FRC or steel mesh.

Geotechnical and structural logging was undertaken with an in-house methodology that is not fully in line with industry-standard methods for direct calculation of geotechnical classification parameters. Future geotechnical logging programmes should utilise a modified logging methodology such as the one used by Snowden Optiro (Snowden, 2008), and log by geotechnical domain rather than drill run or fixed length intervals.

4.4 PFS geotechnical investigation programme

The PFS geotechnical investigation programme should include drilling of diamond core holes in the vicinity of the northern, southern and eastern pit walls, and with orientations roughly orthogonal to the dominant west to east orientation of the current drillholes.

Information on rock material parameters determined by geomechanical laboratory testing programme will be required for PFS level assessments. At a minimum, the PFS programme should include the tests listed in Table 4.11.

Table 4.11 PFS geomechanical test programme

Horizons/tests	Minimum tests per domain*
Soil/saprolite horizons	
Soil characterisation tests (particle size, liquid and plastic limits)	12
Direct shear strength tests	4 sets of 3
Rock horizons	
Unconfined Compressive Strength (UCS) tests with Modulus and Poisson’s Ratio measurements	25
Brazilian Tensile Strength tests	25
Triaxial Strength Tests	6 sets of 3

The geotechnical logging programme should include routine field strength tests with a Point Load Test apparatus.

5 Mine planning

5.1 Mining method

Mining will be by a combination of open pit and underground methods. For the base case (Scenario 3) the main Minyari open pit is planned to be mined prior to the commencement of the underground production.

Open pit mining operations are planned around a fleet of 300-tonne class excavators and 200-tonne capacity dump trucks. Based on a mining production rate of 2 Mtpa at a stripping ratio of approximately 5:1, a peak movement rate of approximately 18 Mtpa equivalent to two loading units will be required. Ore will be transported to the ROM pad via a haul road, and waste rock will be hauled to a local waste dump adjacent to the pit. Open pit mining operations will use conventional drill and blast, and load and haul mining methods.

An underground mining operation is planned to be excavated either post (e.g. Scenario 3) or synchronous with mining the open pit/s. Mining sequencing was evaluated during the scenario phase of the Study. Details of the underground mine is provided in Section 5.3 of this Study.

5.2 Open pit

5.2.1 Mining model preparation

The Mineral Resource block model for each deposit was reblocked to represent typical mining blocks (the selective mining unit or **SMU**) for the scale of excavator selected. The reblocking has the effect of adding dilution to the mineralisation edges and a smoothing grade. The resulting “mining” block model was assumed to include appropriate dilution and ore losses for Minyari, GEO-01 and Minyari North as summarised in Table 5.1.

Table 5.1 Reblock dimensions and resulting dilution and mining recovery factors

Deposit	X (m)	Y (m)	Z (m)	Dilution (%)	Recovery (%)
Minyari	5.0	5.0	5.0	12.1	94.5
GEO-01	5.0	5.0	5.0	0.9	73.7
Minyari North	2.5	2.5	2.5	8.5	71.4

The WACA mineralisation is very narrow, requiring smaller SMU compared to Minyari. This will require a smaller mining fleet. Rather than reblocking, an MSO-style model was generated to model typical dilution and ore losses with a smaller excavator mining to a minimum 2 m width. The MSO parameters for WACA are detailed in Table 7.4.

Table 5.2 WACA resource MSO reblocking parameters and results

Optimisation parameter	Unit	Value
Cut-off grade	Gold (Au) g/t	0.3
Minimum mining width (true width)	m	2.0
Level interval	m	5.0
Section length	m	10.0
Hangingwall dilution (true width)	m	0.25
Footwall dilution (true width)	m	0.25
Minimum parallel waste pillar width	m	5.0
Minimum / maximum footwall dip angle	°	Minimum 45°

5.2.2 Parameters

Surfaces and boundaries

No additional surfaces or boundary constraints were required to be applied to the Mineral Resource models.

Geotechnical constraints

Pit slope angles follow the geotechnical recommendations as presented in Section 4.3.3. Weathering specific overall slope angles were established using the recommended batter angles, berm width and bench heights. The overall slope angles were then used within the optimisation to determine an economical open pit that would be representative of the final design using the given geotechnical design parameters.

During the optimisation process, an overall slope angle is applied between the lowest toe point and the highest crest point and is inclusive of any ramps or additional step backs as shown in Figure 5.1. The overall slope angles (OSA) listed in Table 5.3 were used to constrain the pit optimisation.

Figure 5.1 Slope angle definition

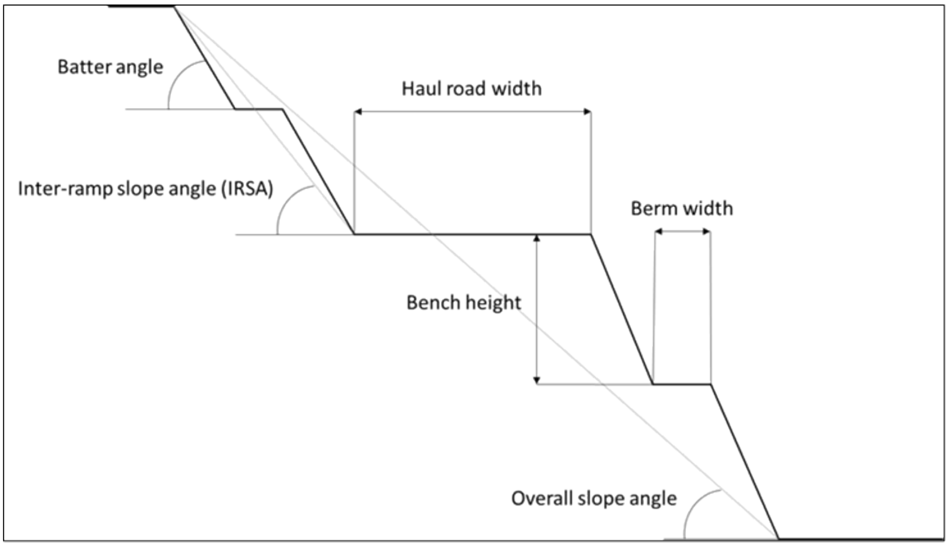


Table 5.3 Overall slope angles for optimisation

Weathering	OSA (°)	MROCK code
Weathered	40	1 to 3
Transitional	45	4
Fresh	50	5

Mining costs

Mining costs used by the optimisation software were prepared by Snowden Optiro. These were an all-inclusive rate to extract and deliver ore/waste to the ROM/waste rock landform (WRL). Costs were sourced from Snowden Optiro's database of recent submissions and are material and bench specific.

Rates for drill and blast were (NB: bcm = bank cubic metre):

- Cover = $0.00/bcm (free dig) [MROCK=1].
- Completely Oxidised = $1.50/bcm [MROCK=2].
- Strongly Oxidised = $1.50/bcm [MROCK=3].
- Partly Oxidised = $2.50/bcm [MROCK=4].
- Fresh Rock = $3.00/bcm [MROCK=5].

Rates for load and haul at surface were:

- Ore/Waste base cost = $7.10/bcm.

Load and haul costs were incremented by $0.15/bcm per 5 m increase in depth from surface.

To capture owners' costs, a mining overhead expense of $2.00/bcm was assumed. This was based on an estimated owners' cost of $1,000,000 per month and mining at 500,000 bcm per month.

Post optimisation validation of the cost per tonne of rock mined results in an average rate of \$4.53/t to \$4.62/t (case dependent). This aligns with current expectations and is representative of mining at the scale required.

5.2.3 Processing throughput, recovery and costs

Six scenarios were investigated comprising two process plant configurations and three throughput rates.

Table 5.4 Optimisation scenarios

Scenario	Process option	Throughput
1	CIL	1 Mtpa
2	CIL	2 Mtpa
3	CIL	3 Mtpa
4	Flotation	1 Mtpa
5	Flotation	2 Mtpa
6	Flotation	3 Mtpa

Recoveries and processing and general and administrative (**G&A**) costs were provided by Strategic Metallurgy and are listed in Table 5.6. Recovery assumptions are listed in Table 5.5. GEO-01 ore body has marginally improved processing recovery for the fresh material and has lower processing costs expected for the CIL scenario. Processing costs are listed in Table 5.6 and for GEO-01 CIL in Table 5.7.

Table 5.5 Processing recoveries by weathering type

Item	Weathered (%)	Transitional (%)	Fresh (%)
CIL recovery			
Gold	95.2	92.0	89.0†
Silver	95.2	92.0	89.0
Flotation recovery			
Gold	67.0	77.9	88.8
Silver	48.4	71.8	95.3
Copper (to copper concentrate)	7.0	46.0	85.0
Cobalt (to cobalt concentrate)	26.7	38.7	50.8

† 89.5% for GEO 01
Source Strategic Metallurgy

Table 5.6 Processing and G&A costs (\$/t processed)

Item	CIL cost			Flotation cost		
	1 Mtpa	2 Mtpa	3 Mtpa	1 Mtpa	2 Mtpa	3 Mtpa
Processing	30.35	22.21	19.21	48.29	32.10	26.87
G&A	4.21	2.10	1.40	4.21	2.10	1.40
Grade control	1.00	1.00	1.00	1.00	1.00	1.00
Total	**35.56**	**25.31**	**21.61**	**53.50**	**35.20**	**29.27**

Source Strategic Metallurgy

Table 5.7 GEO-01 processing cost (\$/t processed)

Item	CIL costs		
	1 Mtpa	2 Mtpa	3 Mtpa
Processing	29.86	21.05	17.81

Source Strategic Metallurgy

5.2.4 Revenue assumptions

Revenue assumptions were obtained from Antipa and were based on independent long-term commodity pricing and currency exchange rate forecasts (September 2024) and benchmarked against similar operations. For the purposes of the optimisation an A$ to US$ currency conversion rate of 0.70 was used. Adopted metal pricings as list in Table 5.8.

Table 5.8 Metal prices and payabilities (0.70 US$/A$ exchange rate)

Item	Unit	Prices		Payabilities	
		US$	A$	CIL	Flotation
Gold	$/oz	2,100	3,000	99.9%	92.5%
Silver	$/oz	24.50	35.00	99.9%	40.0%
Copper	$/t	8,952	12,789	-	93.8%
Cobalt	$/t	49,700	71,000	-	75.0%

Royalties were advised by Antipa as summarised in Table 5.9, and consist of Western Australian State Government royalties plus Sandstorm Gold Royalties Limited's 1.0% NSR royalty.

Table 5.9 Royalty assumptions

Product	Royalty
Bullion (CIL)	3.5%
Concentrate (Flotation)	6.0%

Royalties are based on the realised value of the sold product.

Discounting

For this Study, a discount factor (**DF**) of 7.0% per year was applied as advised by Antipa, which is based on independent long-term DF forecasts.

5.2.5 Pit optimisation

Shells are created by the Lerch-Grossmann (**LG**) method. LG is a mathematical algorithm belonging to the family of Network Flows methods that finds open pit shells yielding maximum profit. The initial step in the optimisation process is to prepare the "Ultimate Pit"; a pit shell defining the limits to mining for the given deposit. The software then undertakes further optimisations to define "LG Phases" or "Shells". These are subsets of the ultimate pit and are successive iterations of the process varying block values (net profit from blocks) by multiplying value by a reducing factor.

Following this process, a series of nested pit shells are created. Each pit shell has a corresponding net present value (**NPV**), as well as total tonnes and grade within the pit shell. Shell number designates the factor by which revenue has been scaled. Each step is a 0.5% increment (Shell 200 has a revenue factor of 1 – i.e. adopts the input revenue factor).

The resulting NPV assumes time flow to be proportional to the tonnage of ore mined. It is important to note that NPVs expressed are exclusive of project capital and associated timings and is a gauge of comparative value rather than true value.

Optimisation results

Figure 5.2, Figure 5.3 and Figure 5.4 illustrate the ore/waste mined vs NPV and associated C1 cost(s) for the Minyari (including Minyari South), GEO-01 and WACA deposits, respectively for the 3.0 Mtpa CIL process plant option. Minyari North was optimised but did not generate an economic pit.

Results for Minyari show there are several step changes in the size of the open pit at increasing revenue factors. These step changes are consistent regardless of throughput rate and process option. As such, the 3.0 Mtpa optimisation results were used for the pit stage selection for all deposits and scenarios. Tonnes and grades for the pit shells selected for pit design are summarised in Table 5.10, Table 5.11 and Table 5.12.

Figure 5.2 Optimisation results – Minyari (incl. Minyari South) CIL 3.0 Mtpa

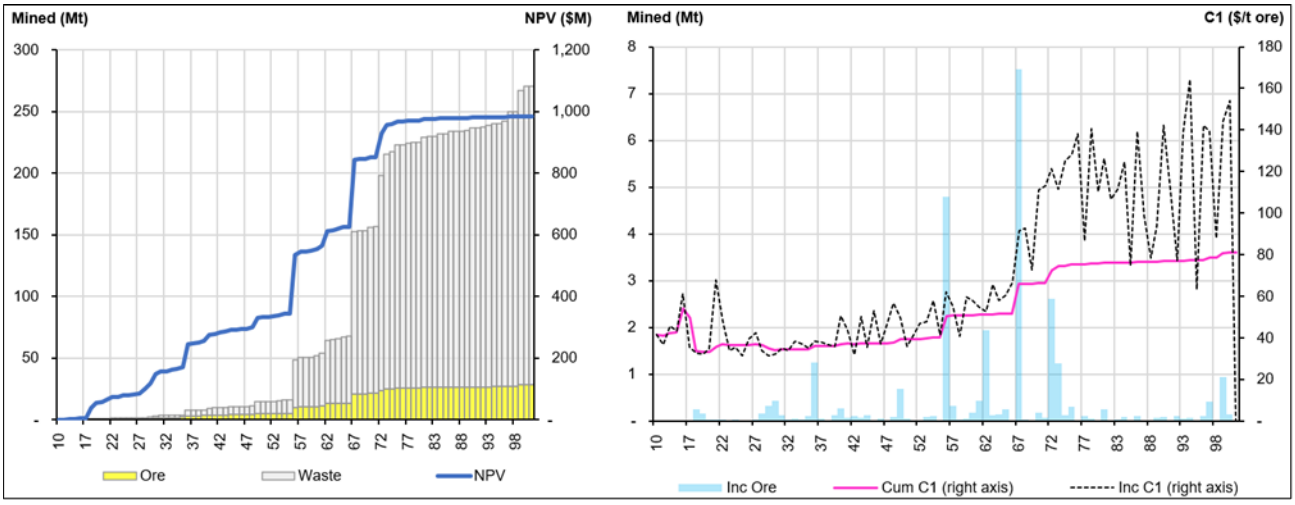


Figure 5.3 Optimisation results – WACA CIL 3 Mtpa

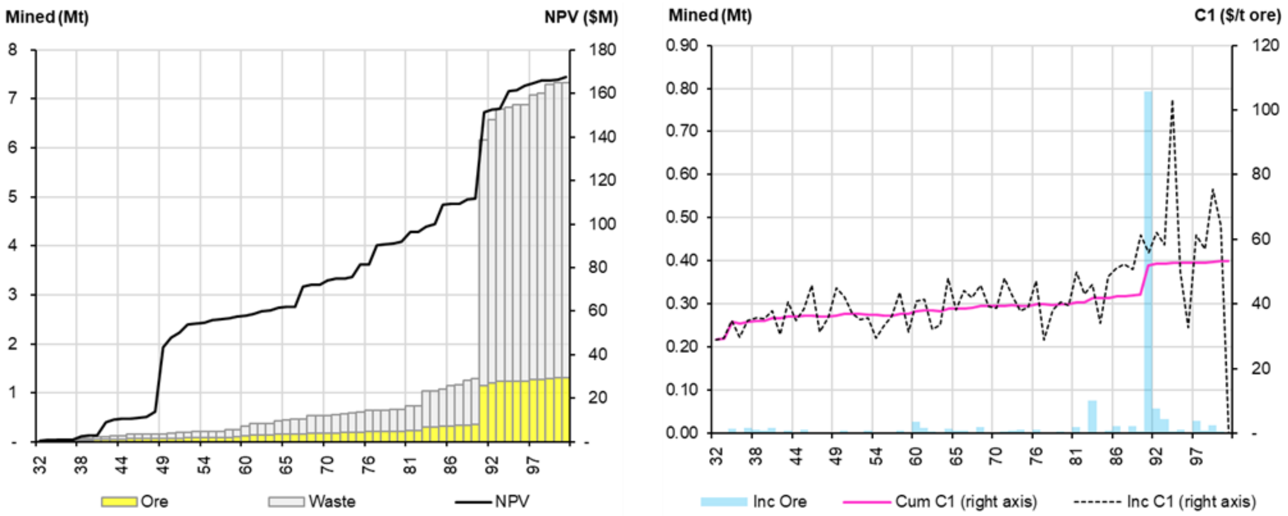


Figure 5.4 Optimisation results – GEO-01 CIL 3 Mtpa

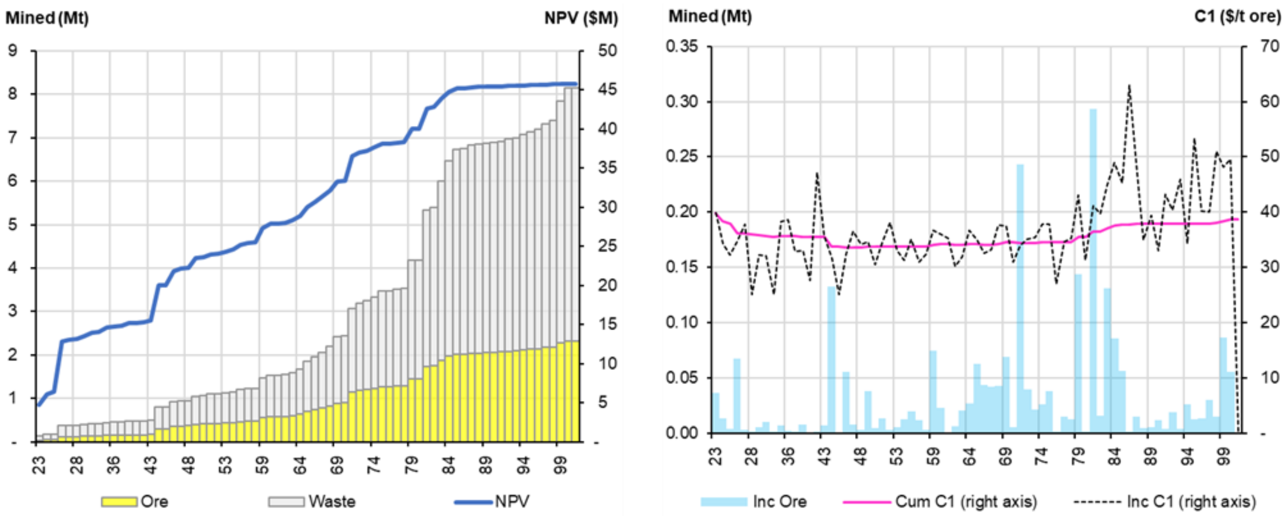


Table 5.10 Open pit shell selected for design – Minyari (incl. Minyari South)

Item	Units	Values			
Shell number		53	66	71	100
Stage number		1	2	3	4
Waste	Mt	10.0	54.0	135.5	242.0
Ore	Mt	5.1	13.5	21.3	28.4
Total	Mt	15.1	67.5	156.8	270.4
Strip ratio	t:t	2.0	4.0	6.3	8.5
Grade					
Gold	g/t	1.3	1.3	1.4	1.5
Silver	g/t	0.4	0.5	0.5	0.5
Copper	%	0.19	0.19	0.19	0.20
Cobalt	%	0.05	0.04	0.04	0.03

Table 5.11 Open pit shell selected for design - WACA

Item	Units	Value
Shell number		100
Waste	Mt	6.0
Ore	Mt	1.3
Total	Mt	7.3
Strip ratio	t:t	4.6
Grade		
Gold	g/t	0.7
Silver	g/t	0.2
Copper	%	0.09
Cobalt	%	0.02

Table 5.12 Open pit shell selected for design - GEO-01

Item	Units	Value
Shell number		100
Waste	Mt	5.8
Ore	Mt	2.3
Total	Mt	8.2
Strip ratio	t:t	2.5
Grade		
Gold	g/t	0.7
Silver	g/t	0.1
Copper	%	0.03
Cobalt	%	0.00

5.2.6 Pit design

Design parameters

The pit design parameters for Minyari, GEO-01 and WACA were based on the following parameters:

- Pit ramps of 30 m for dual lane and 18 m for single lane to accommodate approximately 200-tonne capacity trucks.
- Pit slopes based on the overall slope angles recommended in Section 4.3.3.

- Internal ramp angles estimated assuming approximately two to three ramp segments included in all walls based on the geometry of the pit optimisation shells.
- Bench heights at a multiple of the assumed ore flitch height of 5 m.

Based on these parameters, the following pit design bench and batter dimensions listed in Table 5.13 were selected.

Table 5.13 Pit wall parameters

Material	Depth below surface (m)	Bench height (m)	Batter angle (°)	Berm width (m)	Internal ramp angle (°)	Overall slope angle (°)
Weathered	25 – 80	12.5	55	6	40	37
Fresh (shallow)	250	25	75	7	61	50
Fresh	500	25	75	11	55	45

Stage designs

Intermediate stages were selected to:

- Defer waste mining.
- Provide early mill feed and high initial cash flow margins.
- Achieve practical mining width considerations and ramp access options.
- Have minimal impact on the ultimate pit design position.

The pit optimisation results and stage designs for Minyari, GEO-01 and WACA (shaded) are shown in Figure 5.5, Figure 5.6 and Figure 5.7, respectively.

Figure 5.5 Cross section of optimisation results and selected shells for design - Minyari

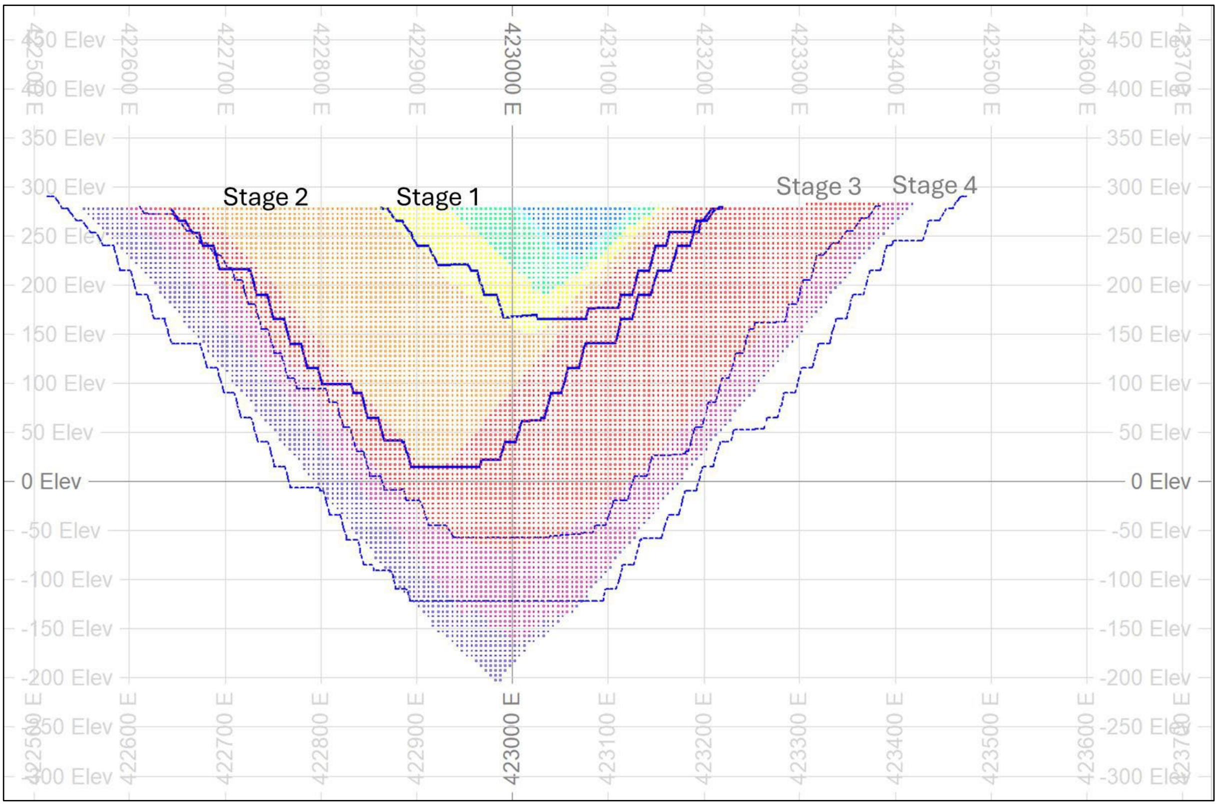


Figure 5.6 Cross section of optimisation results and selected shell for design - WACA

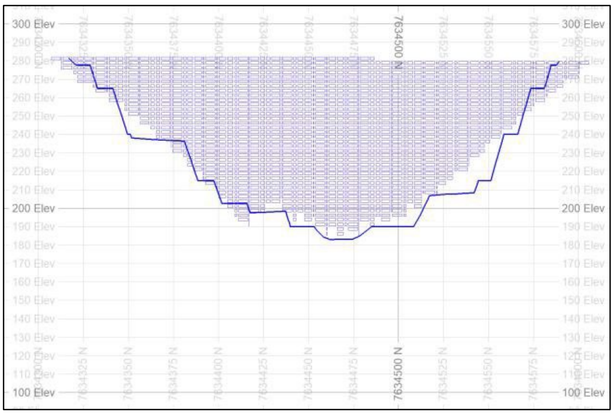
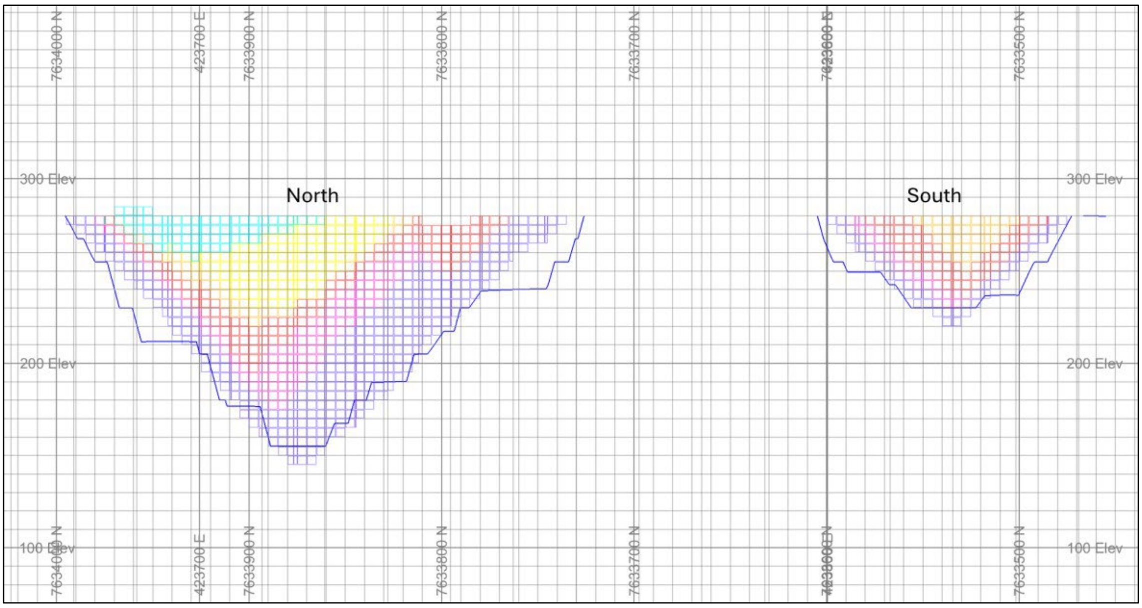
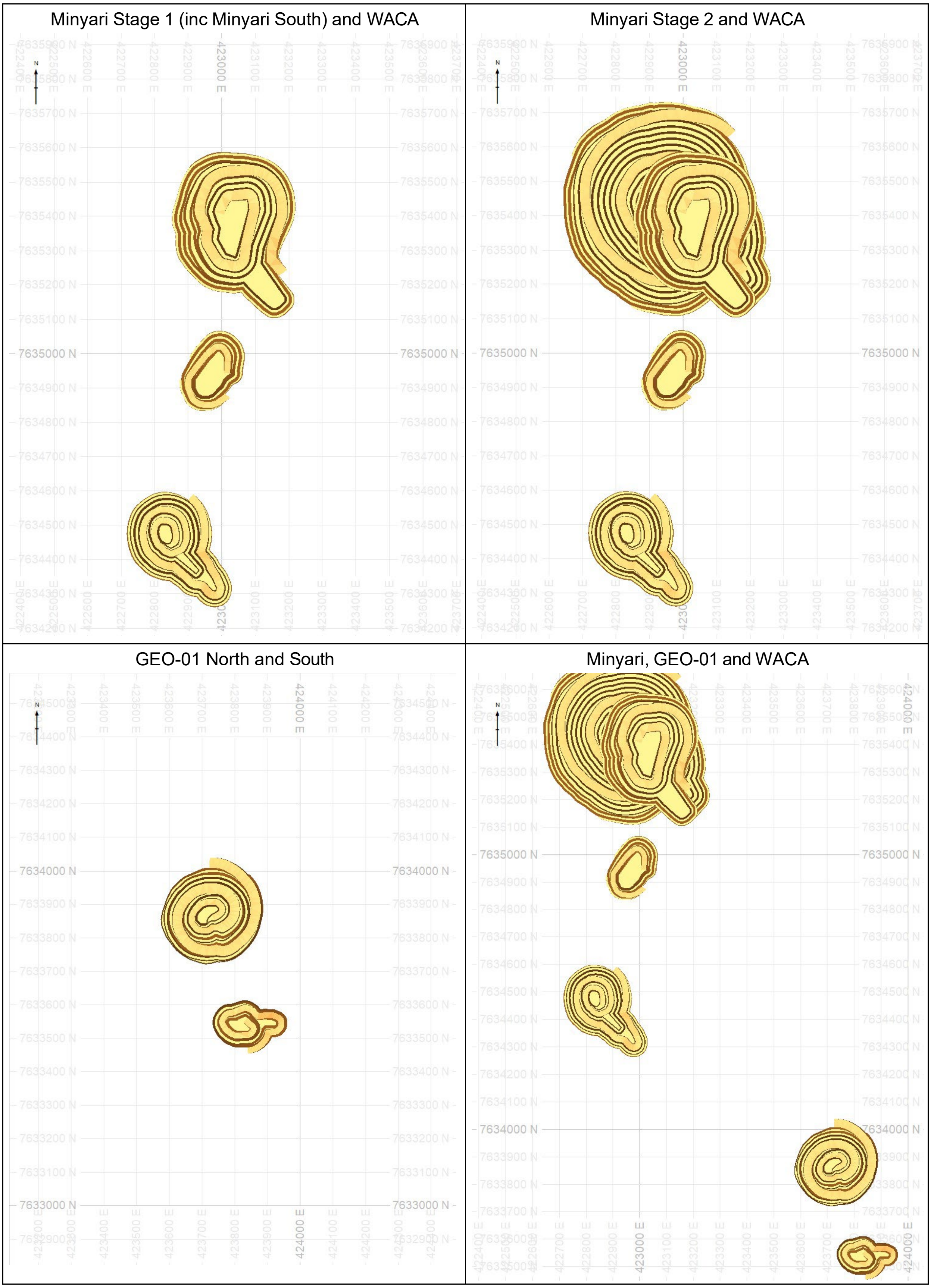


Figure 5.7 Cross section of optimisation results and selected shell for design – GEO-01



Pit stage designs sequence is shown in Figure 7.21. Open pit and underground scenarios were run to test the value of progressing from Stage 2 to 3 and 4.

Figure 5.8 Pit stage sequence



5.3 Underground mining

5.3.1 Underground mining model preparation

To reflect the CIL product (revenue), a gold and silver gold equivalent net smelter return (NSR) field was calculated in the block model. The NSR captures the economic and metallurgical factors for the Study. The formula is therefore:

$$NSR = ((Au\ g/t\ *\ NSR\ dollars/t)\ +\ (Ag\ g/t\ *\ NSR\ Ag\ dollars/t))$$

In values, this is:

$$NSR = ((Au\ g/t\ *\ 82.8)\ +\ (Ag\ g/t\ *\ 1.0))$$

5.3.2 Underground optimisation

Stope optimisations were run on the Mineral Resource model using Datamine Software's Mineable Shape Optimiser® (MSO®) software. Indicated and Inferred Mineral Resources were included during the optimisation process.

Stope sections were prepared on 5 m lengths along strike to provide adequate granularity. These were then reviewed, and anomalous shapes such as isolated or irregular shapes were removed.

Parameters

MSO input parameters used for the evaluation are listed in Table 5.14.

Table 5.14 Underground MSO input parameters

Optimisation parameter	Unit	Minyari
Stope cut-off grade	NSR $/t	100
Minimum mining width (true width)	m	4.0
Level interval	m	25.0
Section length	m	5.0
Hangingwall dilution (true width)	m	0.5
Footwall dilution (true width)	m	0.5
Minimum parallel waste pillar width	m	10.0
Minimum/Maximum footwall dip angle	°	Minimum 45°

For the proposed mining method, an all-in underground mining cost of $80/t was used. For a processing cost of $20/t, this results in a cut-off value of $100/t or 1.21 g/t Au.

Base case results

Results from the underground optimisation for Minyari are shown in Figure 5.9 and Table 5.15.

Stope optimisations we completed over the GEO-01, WACA and Minyari North deposits. These areas did not produce economic stope outlines.

Figure 5.9 MSO results – Minyari deposit

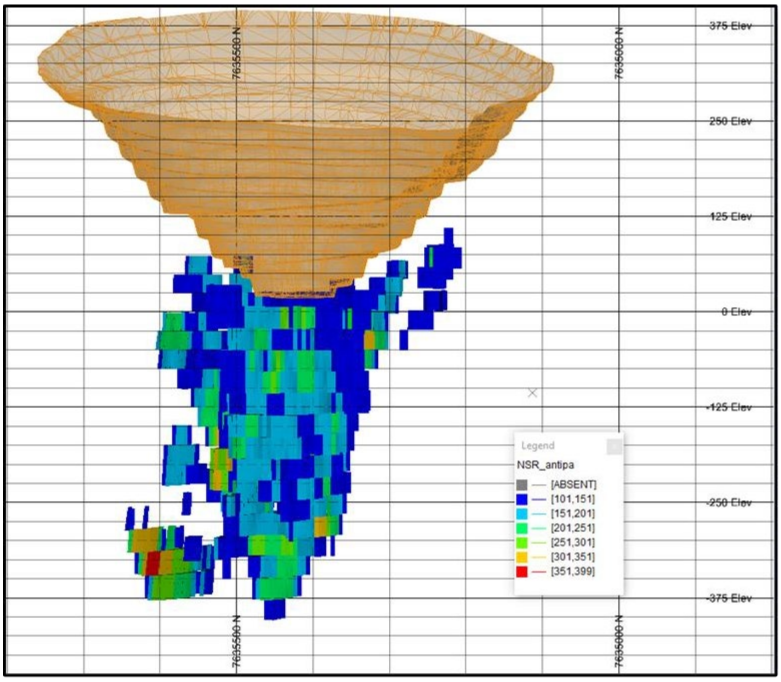


Table 5.15 MSO results by level – Minyari deposit

Level (mRL)	Mined Tonnes (kt)	Au (g/t)	Ag (g/t)	Cu (%)	Co (%)	Au (koz)	Ag (koz)	Cu (t)	Co (t)
75	43	1.4	0.1	0.08	0.01	2	0	35	6
50	184	1.6	0.3	0.11	0.02	9	2	207	29
25	306	1.6	0.3	0.14	0.01	16	3	429	40
0	509	1.6	0.4	0.17	0.02	25	7	884	79
-25	1,202	1.9	0.5	0.20	0.03	73	19	2,413	349
-50	1,529	2.3	0.5	0.23	0.02	113	25	3,482	288
-75	1,814	2.2	0.6	0.20	0.02	128	33	3,576	367
-100	1,567	2.1	0.7	0.26	0.02	107	33	4,062	350
-125	1,168	2.1	0.7	0.24	0.02	79	25	2,771	239
-150	821	2.2	0.7	0.22	0.02	59	18	1,789	171
-175	643	2.2	0.7	0.23	0.02	45	14	1,463	109
-200	772	2.3	0.8	0.27	0.02	56	19	2,107	132
-225	808	2.1	0.7	0.24	0.02	54	19	1,924	125
-250	504	1.8	0.7	0.18	0.02	30	11	924	87
-275	324	2.1	0.7	0.19	0.02	22	7	631	74
-300	246	2.2	0.5	0.14	0.02	17	4	346	41
-325	172	2.5	0.3	0.07	0.01	14	2	113	22
-350	144	2.4	0.3	0.05	0.01	11	1	75	15
Total	**12,757**	**2.1**	**0.6**	**0.21**	**0.02**	**863**	**241**	**27,233**	**2,522**

Scenario results

Based on the MSO results, the following observations were made for the Minyari underground opportunity:

- Stope widths average from 5 m to 100 m and stope panels with continuity between levels, supporting a bulk style mining method.

- Upper levels (-150 mRL to -25 mRL) providing greater than 1.0 Mt per 25 m level, potentially supporting a potential production rate of 2.0 Mtpa assuming a 50 m per year vertical rate of advance

5.3.3 Methodology

Based on the MSO results a low cost sub level cave (SLC) would be possible. However due to the multiple mineral lodes and internal waste zones and more selective method may be required. To minimise dilution and ore loss a modified sublevel cave (M-SLC) was selected as the preferred mining method. The proposed mining method requires a pattern of generally evenly spaced and evenly primary (core) stopes and secondary (rib) stopes, which are overlain by a sill pillar. The sill pillar separates the active mining area from the overlying mined-out area.

M-SLC (Figure 5.10) involves the following process on each level:

- The primary stopes are extracted using long-hole open stoping methods and left open.
- The adjacent secondary stope and the corresponding sill pillar above the primary and stope are blasted into the primary stope void. The size of the primary stope is determined by the swell factor of the secondary stope and rib pillar.
- Waste rockfill, sourced from the open pit waste dump, is introduced above the blasted sill pillar from rock passes established from the base of the open.
- Ribs and sill pillars are fired en-masse, and ore is bogged until a stope shut-off grade is reached.
- As mining progresses downwards a waste rock blanket is maintained on top of the blasted ore, providing passive support to the stoping void.

The method has the advantage that about 25 – 30% of ore is blasted in an open stope with minimal dilution. The remaining 65 - 70% of ore is mined as a semi-sublevel cave which can achieve high production rates to match the processing capacity. Expensive paste fill is not required which results in a lower mining cost compared with conventional open stoping with pastefill. It does, however, incur higher dilution for the secondary stopes and sill pillar.

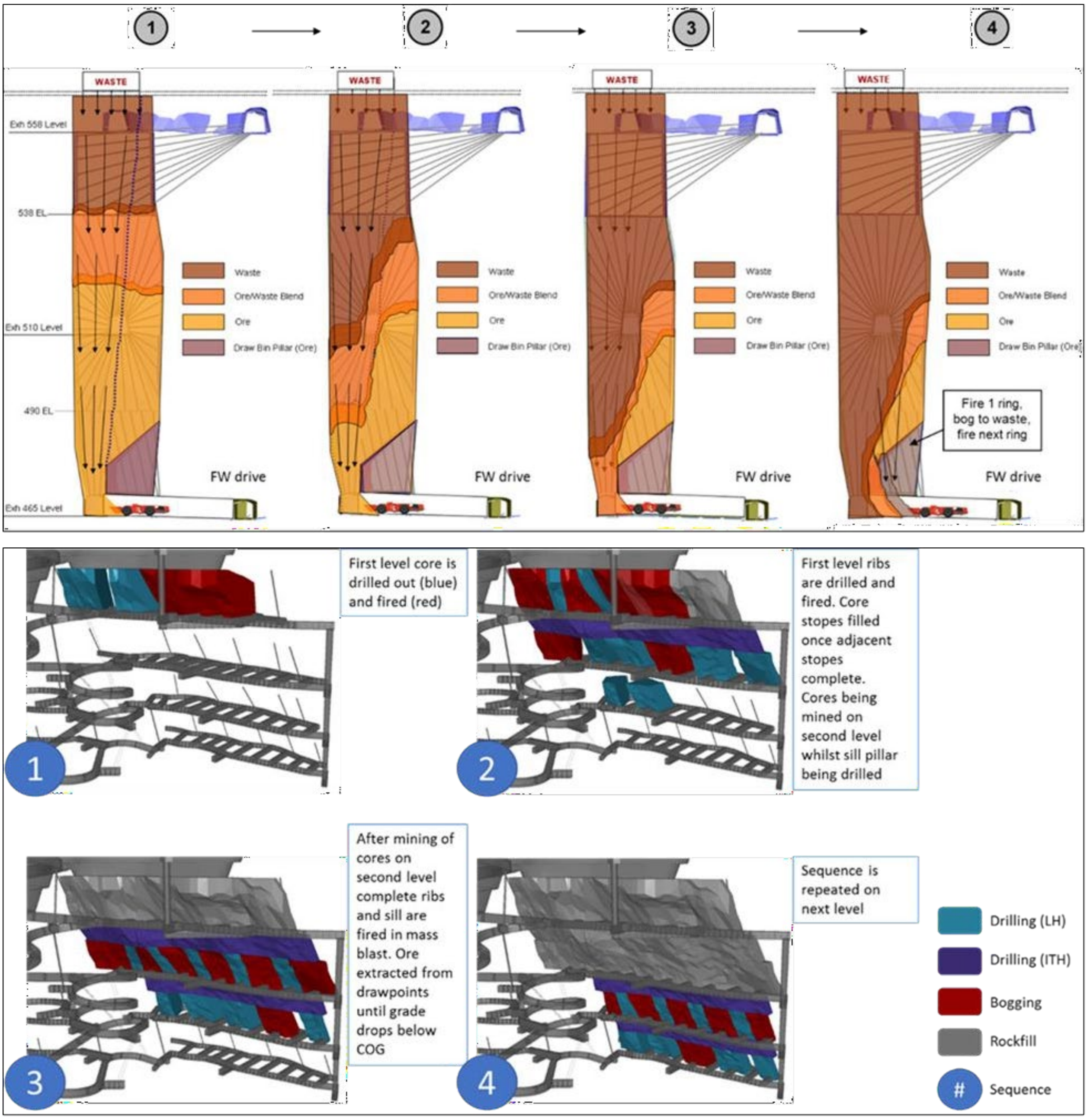
5.3.4 Underground design

A conceptual underground mine design was prepared based on the typical drive dimensions for a 2.0 Mtpa underground operation, with gold production via the 3 Mtpa processing facility scenarios to be supplemented by open pit stockpiles as required, using 60-tonne capacity underground trucks in a 6 m wide by 6 m high development, with gradients up to 1:7.

A ventilation and escapeway concept is demonstrated with the layout, however, ventilation modelling would be required to place the number and sizing of the vent rises based on detailed equipment requirements. Additional fresh air intake rises may also be required.

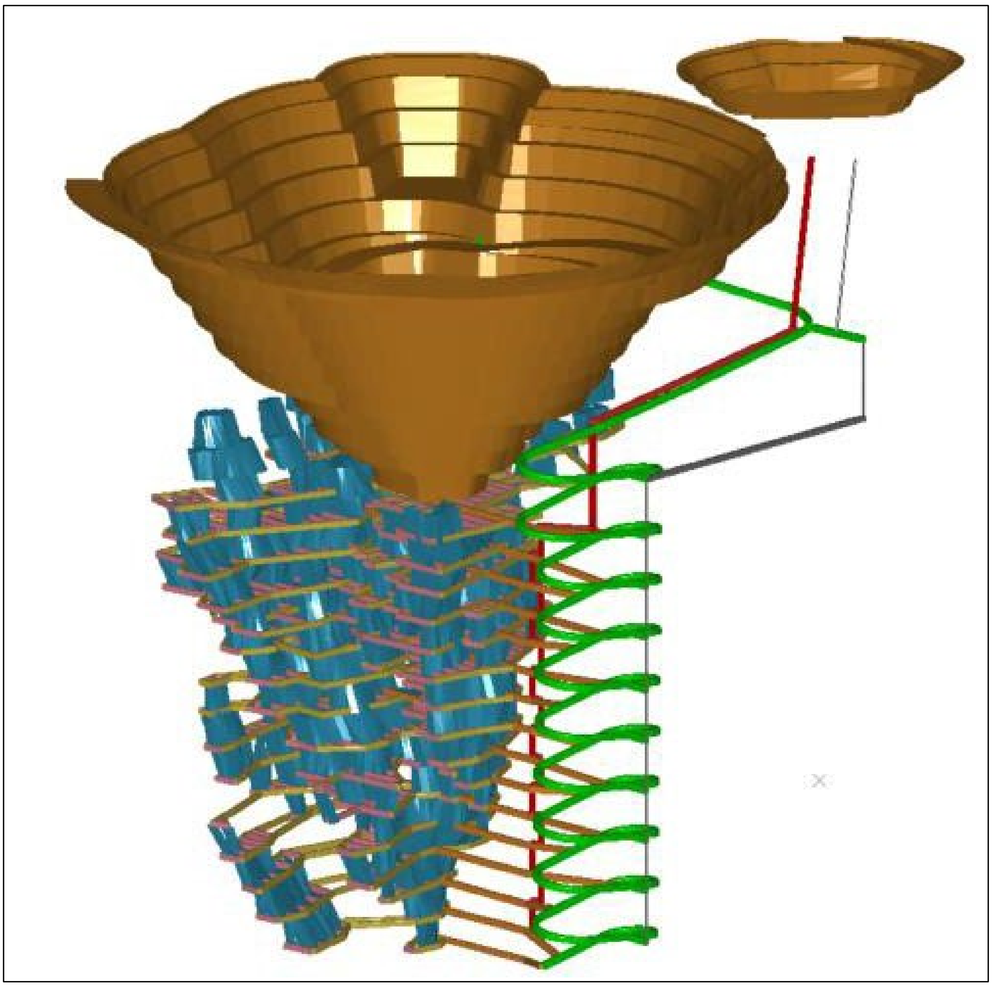
The Minyari South open pit can act as the boxcut for the underground portal and decline. Based on the conceptual underground mine design (Figure 5.11), the decline is also an optimal drill platform for orebody delineating exploration of the deeper Minyari deposit, WACA, Minyari South and Sundown.

Figure 5.10 Generalised M-SLC mining method illustration



Source: Marvel Loch Mine

Figure 5.11 Conceptual Minyari deposit underground mine layout



6 Metallurgical testwork and process flowsheet

Antipa engaged Strategic Metallurgy Pty Ltd (Strategic Metallurgy) as metallurgical consultant to develop a process package for a processing facility to treat ore from the Minyari Dome Project Mineral Resources. The processing cost estimates were developed to a scoping study level (±35%). The report provided includes:

- Process description;
- High-level process flow diagram;
- Major mechanical equipment list;
- High-level mass balance;
- Tailings storage facility (TSF) information; and
- Capital and operating costs.

Antipa requested two options to be assessed during the course of the Study at 1 Mtpa, 2 Mtpa and 3 Mtpa treatment rates, namely:

- Case 1: A free-milling gold and silver recovery flowsheet.
- Case 2: A base metal recovery flowsheet for separate copper-gold-silver and cobalt concentrates.

Appendix A and Appendix B contains the October 2024 addendum report and the July 2022 Minyari Scoping Study Process Design report.

6.1 Testwork

Samples were selected from each ore type across and along strike at the Minyari and WACA deposits. There does not appear to be a substantial difference in performance between the Minyari and WACA samples. No testwork has been completed at Minyari South, Minyari North or Sundown at this scoping study stage; however, it is expected that the performance would be similar to that of Minyari due to no significant differences in the chemistry and mineralogy. Preliminary gold only test work was completed at GEO-01.

A total of seven gravity concentration and diagnostic leach tests were conducted at the Minyari and WACA deposits. Testing focused on determining the proportion of the gold that is gravity recoverable, cyanide amenable, sulphide locked, and silicate locked. The flowsheet utilises conventional gravity concentration and cyanidation techniques followed by an aqua regia digest and a fire assay on the final tails sample. The sample is passed through a Knelson gravity concentrator. The intensive cyanidation tailings residue is then washed and combined with the Knelson tailings where it is leached under direct cyanidation conditions to determine the proportion of cyanide amenable gold. The direct cyanidation tails is then washed, and acid leached with aqua regia to determine the proportion of sulphide locked gold; the tails of the aqua regia leach is then fire assayed to determine the proportion of gold locked in silicates.

The gravity recovery of the oxide samples is considered low. However, the overall recovery (gravity + cyanide) is high, ranging between 92% and 97%. The primary samples demonstrate a moderate to high degree of gravity recoverable gold, however, the overall recoveries are slightly lower (85 to 91%) than that seen in oxide samples but are still considered good. A summary of results is provided in Table 6.1.

A test work programme has begun at GEO-01, initially testing cyanide recoverable gold at different grind sizes. At GEO-01, the recovery in the primary sample is high and cyanide consumption is low. A summary of results is provided in Table 6.2 and Source: Strategic Metallurgy.

Table 6.1 Diagnostic leach testwork results summary

	Unit	OX 1.0	OX 2.0	OX 3.0	PR 1.2	PR 4.7	PR 2.7 (West)	PR 2.5 (WACA)
Assayed head	g/t	1.20	2.16	2.85	1.21	3.39	1.83	2.40
Calculated head	g/t	0.99	1.05	2.35	1.09	3.14	2.24	2.08

Cyanide consumption	kg/t	1.19	1.90	1.96	0.52	0.89	0.63	0.63
Gravity gold	%	10	9	24	27	35	54	34
Cyanide amenable	%	87	83	73	59	53	36	51
Sulphide locked	%	2	6	2	13	11	9	12
Silicate locked	%	1	2	1	1	0	1	3

Source: Strategic Metallurgy

Table 6.2 GEO -01 testwork results summary

	Head Assays		Averaged	Head Assays
Composite	Au	Au repeat	Au (g/t)	Ag (g/t)
GEO-01	2.47	2.15	2.31	<2.00

Source: Strategic Metallurgy

Table 6.3 GEO-01 grid size recovery testwork

	Gravity	Total	Lime addition	NaCN addition	NaCN consumed	Calculated
Grind Size	Gold	Extraction	(kg/t)	(kg/t)	(kg/t)	Head (g/t)
212 µm	28.7%	85.9%	0.091	0.750	0.216	1.875
150 µm	27.8%	86.5%	0.195	0.750	0.244	1.941
106 µm	27.1%	89.8%	0.143	0.750	0.289	1.987
75 µm	28.2%	89.5%	0.154	0.750	0.286	1.910

Source: Strategic Metallurgy

Overall, the test results indicate that the gold-bearing ore (oxide and primary) will respond well to typical free milling conditions. Cyanide consumption for oxide composites (excluding GEO-01) is on the higher end (>1 kg/t) for a conventional free milling operation due to cyanide soluble copper.

Based on the 2017 results at Minyari and WACA, a sighter testwork programme was conducted in 2018 to identify the viability of producing a saleable copper/cobalt concentrate via flotation or through gravity concentration. Overall, the testwork programme achieved both primary objectives.

A total of six flotation tests were conducted. A high-level summary of the flotation results is provided in Table 6.4. All tests were conducted in Perth tap water at a primary grind size of P80 75 µm. Testing focused on achieving maximum grade and recovery of copper and cobalt to their respective concentrates, no particular emphasis was made on achieving gold recovery. Gold recovery is defined in this report by gold recovered to the copper concentrate. It should be noted that both gold and copper reporting to the cobalt concentrate may receive credits. The flotation reagents utilised in this testwork programme are potassium amyl xanthate (**PAX**) and copper sulphate to activate and float cobalt sulphides. A precious metal specific di-alkyl-di-thiophosphinate promoter (3418A) was used to improve selectivity and recovery of copper over other iron sulphide minerals. Aero 3477 (A3477) was used in the selective flotation of cobalt, over other iron sulphide minerals. Methyl isobutyl carbinol (**MIBC**) was used as a frother for all the flotation tests. Sodium silicate was used to disperse fine particles. Triethylenetetramine (**TETA**) is an organic reagent used in combination with sulphite to depress iron sulphide minerals during sulphide flotation. Lime and hydrogen sulphide was used to modify the pH, aiding in the activation a depression of cobaltite.

Table 6.4 Flotation testwork results summary

Test	Copper/gold concentrate				Cobalt concentrate	
	Cleaner recovery (rougher)		Grade		Cleaner recovery (rougher)	Grade
	Copper	Gold	Copper	Gold	Cobalt	Cobalt
FT 8	(87.3%)	(86%)	3.9%	11.7 g/t	(68.2%)	1.5%
FT 9	(93.4%)	N/A	7.0%	N/A	(11.6%)	0.2%
FT 10	92.6% (97.7%)	(88.4%)	6.3%	17.5 g/t	3.9% (90.1%)	0.3%

FT 11	88.4% (92.3%)	82.0 (84.2%)	11.7%	21.7 g/t	(47.2%)	1.2%
FT 12	85% (93.9%)	68.0 (77.0%)	14.4%	39.5 g/t	35.9% (40.9%)	2.7%
FT 13	83.4% (91.6%)	63.5 (81.7%)	12.7%	22 g/t	50.8% (61.8%)	3.4%

Source: Strategic Metallurgy

A total of two gravity tests were conducted the primary and oxide ore. The gravity testwork programme objective was to determine if a saleable cobalt concentrate could be generated by gravity separation. To maximise recovery to a gravity concentrate 5 kg of each sample was passed through a falcon concentrator three times to simulate the potential recovery from a continuous falcon concentrator. The concentrates from the falcon concentrator were then combined and tabled to upgrade the concentrate further. The results from the gravity tests are summarised in Table 6.5.

Table 6.5 Gravity testwork results summary

	Mass (%)	Gold		Copper		Cobalt	
		g/t	% dist.	%	% dist.	%	% dist.
PR3_1710							
Table Conc	0.23	238	32.4	4.97	3.22	10.8	40.5
OX1_1710							
Table Conc	0.08	432	18.5	4.21	0.84	6.54	4.1

Source: Strategic Metallurgy

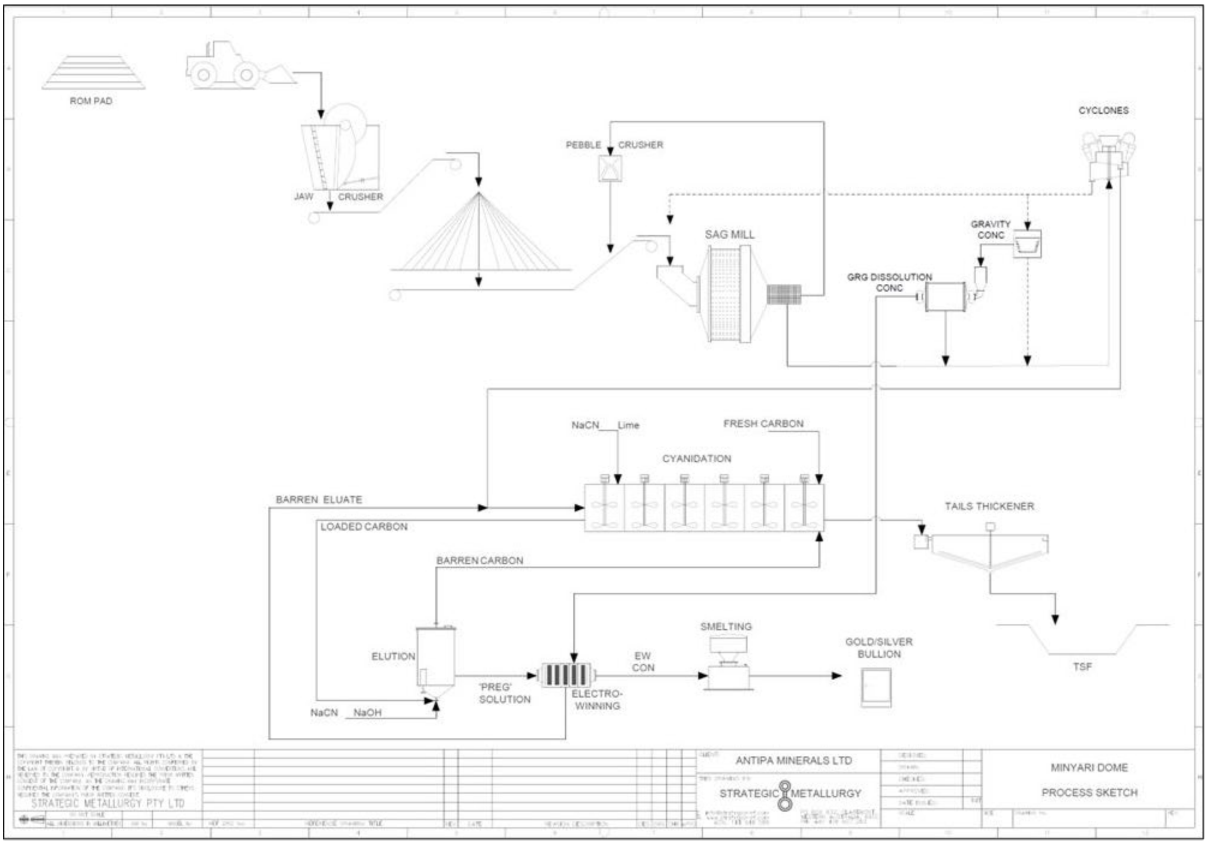
6.2 Process flowsheet

The process flows provided below describes the processes necessary to treat Minyari ore to produce either doré gold (Case 1) or separate saleable copper/gold and cobalt concentrates (Case 2).

The average cumulative gravity and cyanide recoverable gold from testwork has been used to provide the CIL flowsheet gold recovery for each ore type. No testwork has been completed from ore representing transitional material and has assumed the numerical average of both oxide and fresh.

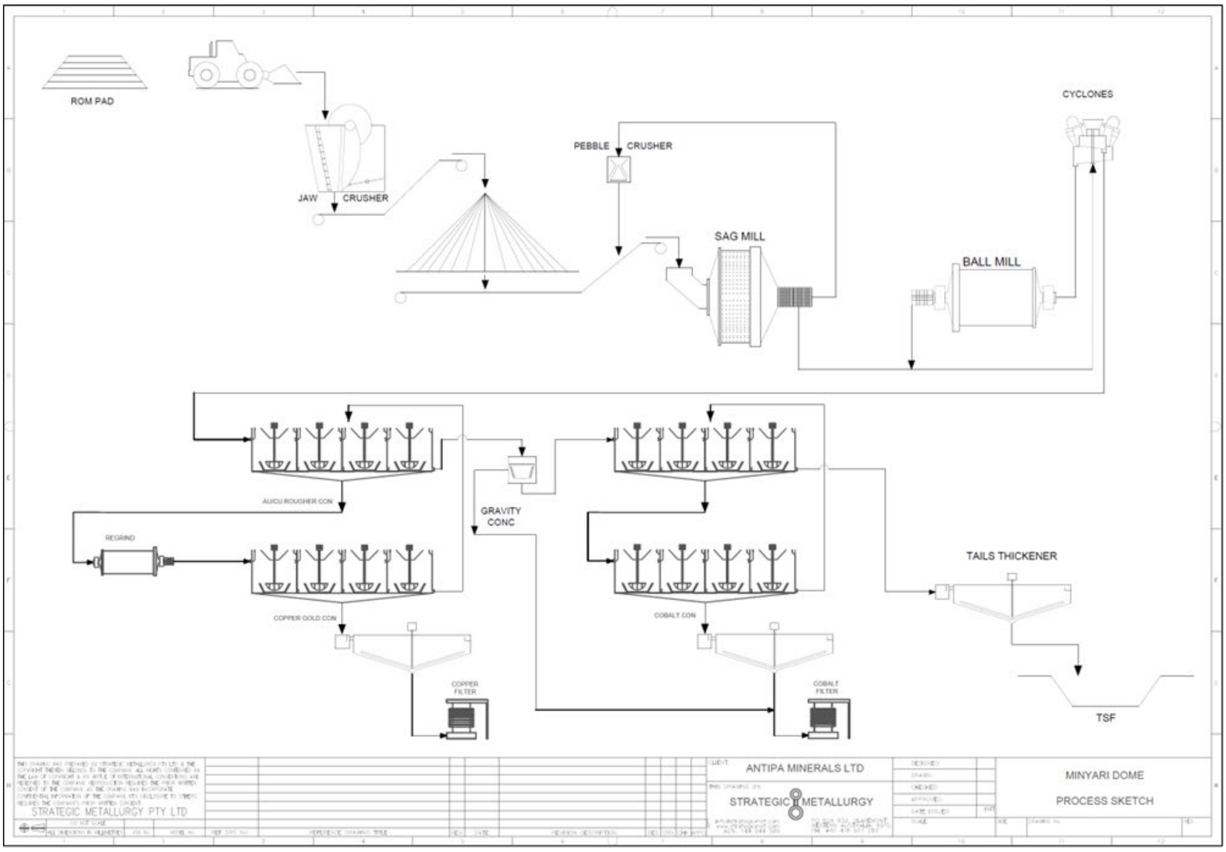
The concentrator makes use of differential flotation to produce separate copper and cobalt concentrate products, first floating copper minerals followed by cobalt minerals. Both design cases will incorporate similar comminution processes. Where relevant, process variations between design cases have been described. A summarised flowsheet illustrating the major processes is provided in Figure 6.1 and Figure 6.2.

Figure 6.1 Block flow diagram of CIL flowsheet – Case 1



Source: Strategic Metallurgy

Figure 6.2 Block flow diagram of flotation concentrator – Case 2



Source: Strategic Metallurgy

6.3 Tailings storage concept

A tailings storage facility (**TSF**) is required to provide LOM storage for tailings from the Project's process plant. The TSF will be constructed in staged compartments during the LOM using earth fill embankments. Tailings will be deposited along the perimeter using a beach drainage system to a central decant water collection facility.

It is assumed the TSF will be constructed on flat ground in a paddock style arrangement. The plant provides for three nominal design feed rates; however, the TSF will be designed to accommodate approximately 30 Mt.

It is proposed that constructions or lifts will occur every one to two years and the final TSF area will occupy approximately 130 hectares.

7 Site layout

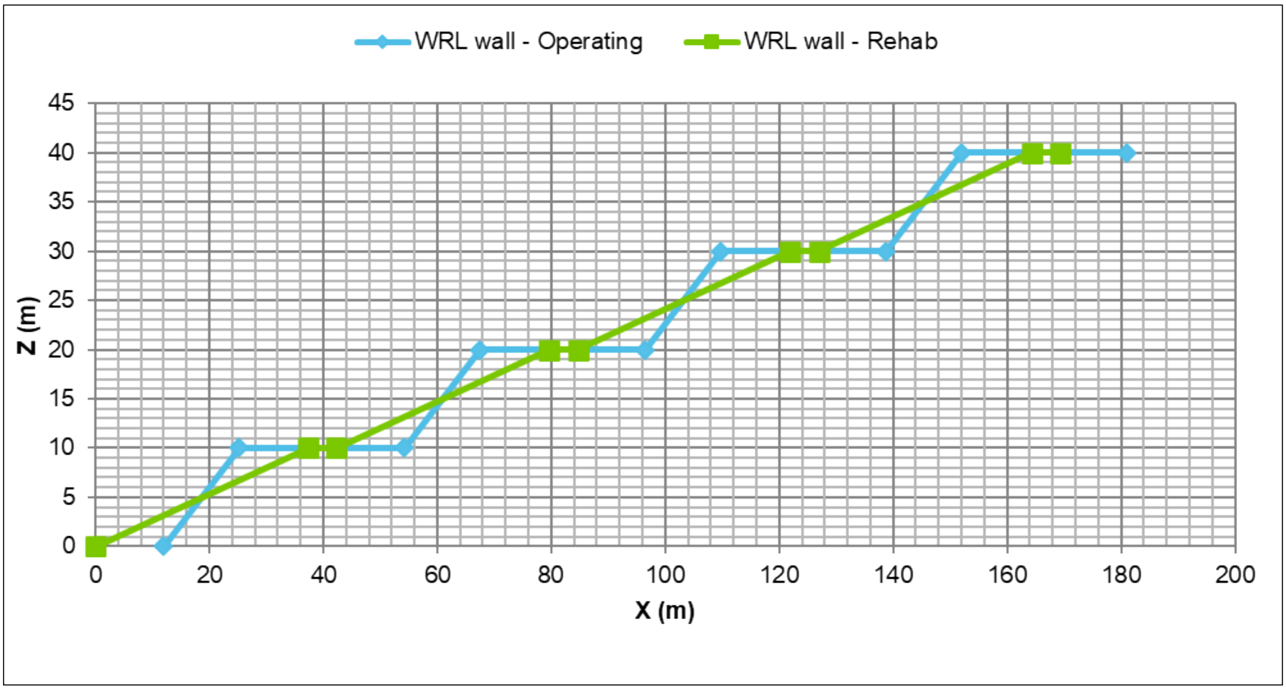
7.1 Mining infrastructure

The waste rock design was prepared for the Minyari and WACA open pits. Criteria for design was as follows:

- Storage for 31 Mbcm waste from the open pits with a 25% swell factor a capacity of 40 Mm^3.
- Generic rehabilitation parameters:
  - 15° slopes;
  - 10 m lifts;
  - 5 m berms (runoff catchment); and
  - Height 40 m (potentially could be higher depending on environmental permitting and optimal haulage).
- General location to the southeast of the Minyari open pit.
- Placement outside the zone of potential underground instability.

It is assumed the waste dump will be stacked using 10 m lifts with an angle of repose at approximately 37°. Once a side has been completed, progressive rehabilitation of the dump can proceed. Operational berm widths of 29 m would allow for the WRL to be pushed down by track dozers. as shown in Figure 7.1.

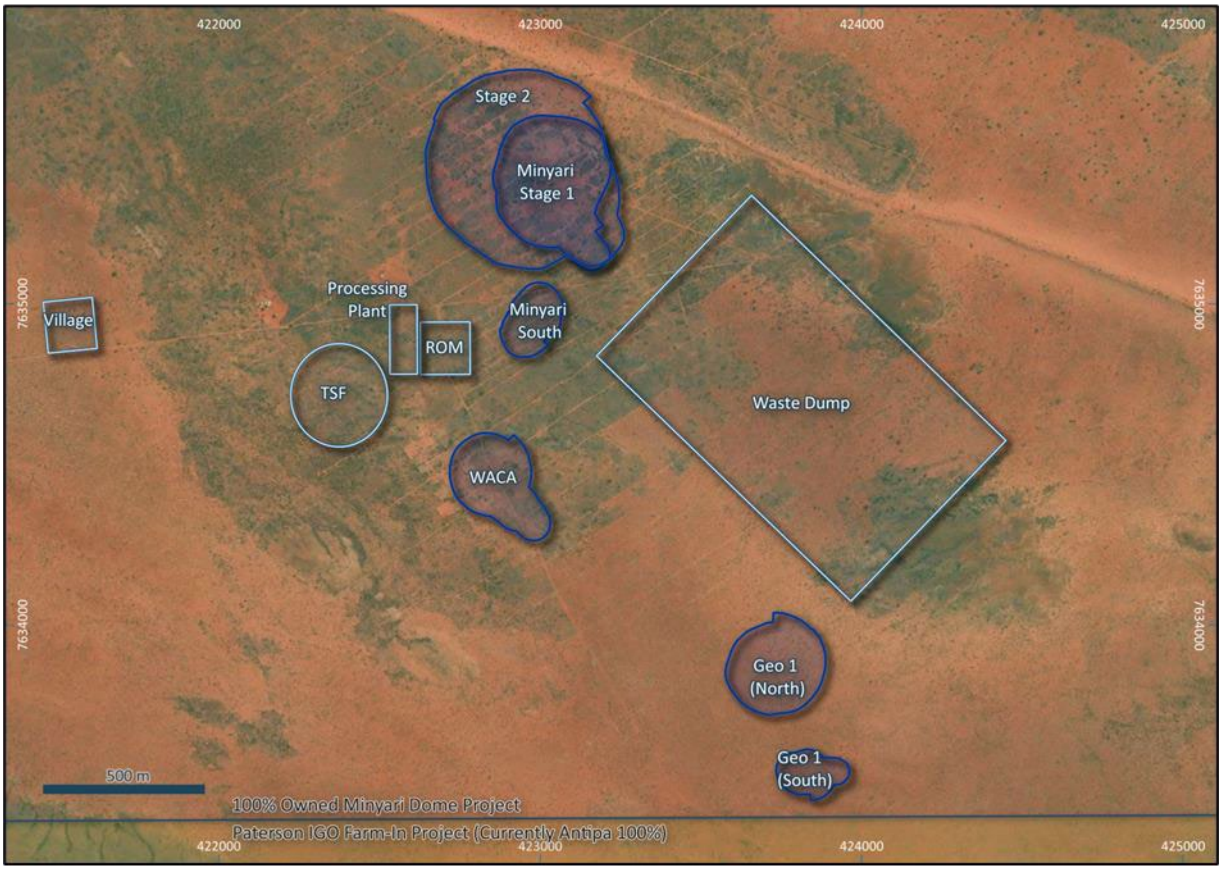
Figure 7.1 Waste dump walls – operating and rehabilitated profile



7.2 Site layout

The proposed site layout is shown in Figure 7.2, and includes road accessways, the accommodation camp, the processing plant and administration buildings, a tailings dam, the open pits, and waste rock dump.

Figure 7.2 Proposed site layout



Source: Antipa

8 Environmental and social

8.1 Landscape

The Project is located in the Mackay subregion of the Great Sandy Desert bioregion of Western Australia. The landscape is characterised by red sand plains, dune fields and remnant rocky outcrops where vegetation is predominantly comprised of spinifex grasslands, low woodlands and shrubs.

The dominant land use of the Mackay subregion includes Unallocated Crown Land (UCL), conservation areas, Aboriginal lands and Reserves, mining and very few small areas of urban environments. There are no Threatened Ecological Communities (**TECs**) in the Mackay subregion and Antipa's tenure do not intersect any Environmentally Sensitive Areas (**ESAs**), conservation reserves, wetlands of National Importance or National Parks.

8.2 Environmental and hydrological studies

Several Environmental Studies and hydrological / hydrogeological studies were conducted in 2023 and 2024 as part of preliminary Pee-Feasibility Study activities.

8.2.1 Desktop environmental study

Desktop Study conducted by Stantec in July 2023 to identify the environmental values of the Survey Area and surrounds, determine baseline studies that are likely to be required to inform environmental approvals and Environmental Impact Assessments (EIAs) and to develop a strategy to facilitate environmental approvals for the Project.

8.2.2 Desktop hydrology and hydrogeology Study

Desktop Study conducted by Rockwater in May 2023 to assess surface water (Hydrology), including assessment of climate models to evaluate surface water influx over the life of the project, determine exiting surface water run-off trends and assess viability for offloading any excess water determined by water balance studies, including flood mitigation strategies.

Desktop Study to assess groundwater (Hydrogeology), including a summary of aquifer characterisation and potential impacts for the project, a summary of site water requirements and potential water sources proximal to the project area, provide a list of information gaps and propose field investigations including areas for water exploration and potential water bore locations.

8.2.3 Pilot subterranean fauna study

Field Study conducted by Stantec in March 2024 to investigate the presence of any subterranean fauna, including stygofauna and troglofauna, at the project area. The Study was conducted to a coarse level of identification with no confirmed stygofauna or troglofauna species collected.

8.2.4 Baseline flora and fauna study

Field Study conducted by Stantec in September 2024 to undertake a Reconnaissance Flora and Fauna Survey to identify any priority flora and fauna, complete preliminary habitat mapping and refine areas for detailed baseline studies.

Numerous field studies have been previously conducted across the broader region by Newcrest, in particular for the Telfer mine site and associated infrastructure and infrastructural corridors, which are available online via the DEMIRS Open File system.

8.3 Climate and climate change

The nearest Bureau of Meteorology weather station is Telfer Aerodrome. The climate is defined as semi-arid to tropical inland desert with warm, dry winters and hot summers with seasonal tropical lows ± tropical cyclones occurring from December to March.

Average annual rainfall is 350 to 400 mm with the majority of rainfall occurring from December to March. Average maximum temperatures range from 40.4°C in January to 25.3°C in July, with average minimum temperatures ranging from 26.0°C in January to 10.6°C in July.

Climate change projections for the Pilbara region by the Western Australia State Government suggest:

- Average, minimum and maximum temperatures will rise with the duration and intensity of hot spells to increase in the north of Western Australia, with an increased bushfire risk.
- Decrease in annual rainfall in the western Pilbara and an increase in annual rainfall in the eastern Pilbara.
- Decrease in frequency of tropical cyclones but increase in intensity due to a warmer atmosphere holding more water vapour.

8.4 Native title

The project area is contained completely within land where the Martu people have been determined to hold Native Title Rights under the Native Title Act 1993. These Native Title Rights grant the Martu people exclusive use, occupation and possession of their determination area, including administration of access within their determination area. Antipa have an excellent working relationship with the Martu people and Jamukurnu-Yapalikunu Aboriginal Corporation (**JYAC**) (previously entitled Western Desert Lands Aboriginal Corporation - WDLAC), the Prescribed Body Corporate that holds and manages

Native Title for the Martu common law holders of the Martu Native Title determinations.

One of several Land Access and Mineral Exploration Agreements (**LAA**) between Antipa Resources Pty Ltd (a wholly owned subsidiary of Antipa minerals Ltd) and JYAC, entitled the “North Telfer Project”, was signed on 26 July 2015 which grants Antipa access and the ability for Antipa to conduct exploration activities on the Minyari Dome Project, including Exploration Licence E45/3919 which contains the Minyari, GEO-01, WACA, Sundown, Minyari South, Minyari North and WACA West Mineral Resources.

8.5 Heritage

Numerous heritage surveys and Martu monitoring programmes have been undertaken across the Minyari Dome Project in accordance with the LAA to approve work areas prior to conducting any ground disturbing exploration activities.

Heritage surveys are conducted with an archaeologist, anthropologist and typically eight Traditional Owners as appointed by JYAC, with several Antipa representatives providing survey assistance. The various heritage survey reports document all archaeological and anthropological findings for each survey.

Martu monitoring programmes are conducted with typically two Martu representatives appointed by JYAC to monitor ground disturbing activities for any sub-surface heritage artefacts.

8.6 Community relations

Key stakeholders for the Minyari Dome Project include:

- The Martu People/JYAC
- DEMIRS

Relevant mining and/or exploration companies active in the immediate region include:

- Newmont
- Greatland Gold Plc
- IGO
- Rio Tinto.

No pastoral leases or urban environments are located in the vicinity of the Minyari Dome Project.

8.7 Permitting

All tenements within the Minyari Dome Project are in “good standing” with the DEMIRS.

Applications for a Mining Licence and Miscellaneous Licence(s) are required to develop the Minyari Dome Project from an exploration project into an operational mine site. Any application for a Mining Licence is subject to negotiation with JYAC, as per clause 13.2 of the North Telfer Project LAA.

Any additional approvals required, as identified by the Scoping Study Update and/or Pre-Feasibility Study workstreams, internally or externally, will be sought in a timely manner to ensure all appropriate approvals are in place for the Project.

9 Costs and revenues

9.1 Accuracy/battery limits

The cost basis for the estimate has been developed to represent the mining methods outlined within this Study. The mining cost estimate is presented in Australian dollars and has an accuracy of ±35%.

The mining cost estimate considers all costs incurred to mine material, deliver it to the processing plant ROM pad. Battery limits are as follows:

- Mining site preparation, establishment, and mobilisation.
- Mining disestablishment and demobilisation.
- Mining-specific capital costs only.
- Mining rates are an all-in rate considering equipment/labour/maintenance/consumables.
- All associated administrative costs, such as fly-in/fly-out (FIFO) and camp costs, are captured.

All cost estimates are expressed in Australian dollars (A$), unless noted otherwise. The exchange rate of A$1.00 to US$0.70 was provided by Antipa. No allowance for variation in the exchange rate has been included in the estimate.

No allowances have been included within the estimates for the following items:

- GST (this is a refundable expense)
- Withholding taxes (if applicable)
- Escalation or inflation
- Financial charges of any description
- Interest
- Depreciation or amortisation
- Contingencies.

9.2 Methodology

The proposed operating model is to use a contractor operated fleet to drill, blast, excavate and haul material to designated locations.

Open pit mining assumes the use of a conventional diesel-powered mobile fleet of backhoe excavators and off-highway dump trucks. Drilling and blasting is assumed to only be undertaken on all material apart from surface cover using conventional diesel-powered surface drills and a mobile explosives manufacturing unit (MMU) providing emulsion-based explosives directly to blastholes. The surface mining fleet will deliver ore directly to the processing plant ROM pad. Waste is planned to be either deposited in locations for use in construction or dumped on surface waste dumps proximal to pit ramp crests.

Underground mining assumes a M-SLC method will be used.

9.3 Capital cost

9.3.1 Pre-production

The pre-production capital costs are estimated at $306 million for the CIL case or $368 million for the Flotation case for the scenario 3 (3 Mtpa). Input capital costs excluding the pre-production investment is shown in Table 8.1.

Table 9.1 Pre-production capital cost summary

Area	Unit	CIL	Flotation
Site	$ M	216	278

Open pit	$ M	90	90
Underground	$ M	0	0
Total	**$ M**	**306**	**368**

Source: Strategic Metallurgy and Snowden Optiro

9.3.2 Site capital

Processing and site capital costs listed are Table 9.2.

Table 9.2 Processing and G&A capital works

Site capital	Unit	1 Mtpa	2 Mtpa	3 Mtpa
CIL process plant	$ M LS	95.4	133.6	162.1
Flotation process plant	$ M LS	121.2	184.4	231.8
TSF	$ M LS	16.6	16.6	16.6
Camp	$ M LS	16.7	17.3	22.0
Administration	$ M LS	3.3	3.5	4.4
Services	$ M LS	2.2	2.3	2.9

Source: Strategic Metallurgy

9.3.3 Open pit capital

Typical open pit establishment capital costs are detailed in Table 9.3 and Table 9.4.

Table 9.3 Open pit mobilisation assumptions

Item	Unit	Mobilisation	Demobilisation
Excavator	$ LS	103,500	103,500
Truck	$ LS	115,000	115,000
Dozer	$ LS	69,000	69,000
Grader	$ LS	28,750	28,750
Water cart	$ LS	34,500	34,500
Blast-hole drill rig	$ LS	73,319	73,319
Stemming loader	$ LS	120,074	120,074
Service truck	$ LS	28,750	28,750
IT loader	$ LS	25,300	25,300
Rock-breaker	$ LS	28,750	28,750
Light vehicle	$ LS	46,000	46,000
Ancillary plant	$ LS	25,875	25,875
Total pre-production mobilisation	**$ M LS**	**13.2**	**TOTAL**

Table 9.4 Open pit capital works pre-production

Open pit capital	Unit	1 Mtpa	2 Mtpa	3 Mtpa
Establishment	$ M LS	2.3	2.3	2.3
Site works	$ M LS	0.6	1.2	2.3

9.3.4 Underground capital

Capital costs associated with the establishment of the underground mine generally relate to infrastructure items that are required to support the underground operation (e.g. primary ventilation fans, portal establishment, mine services) and capitalised mine development (decline and some level access development).

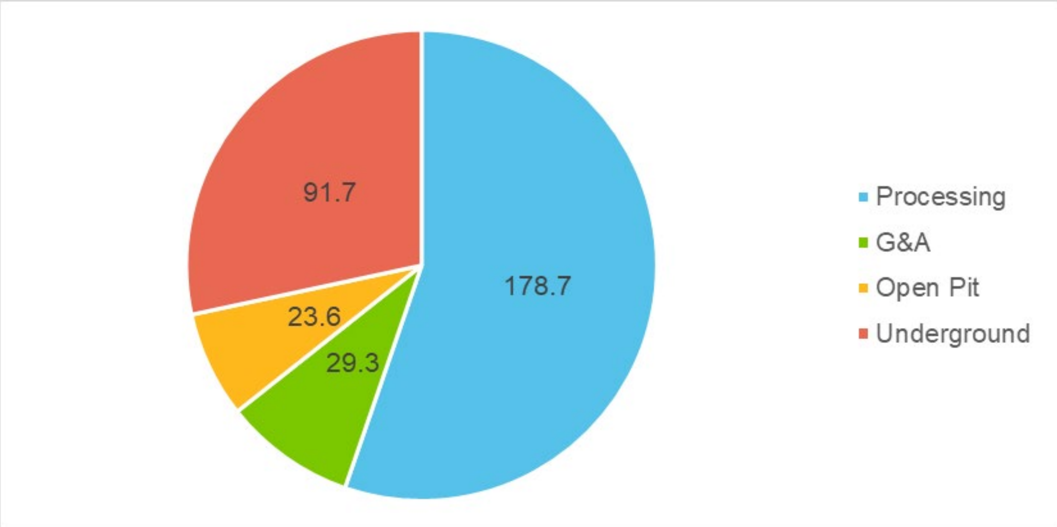
Estimates were prepared by Snowden Optiro and are summarised in Table 9.5.

Table 9.5 Underground capital works

Underground capital	Unit	Capital
Mobilisation and establishment	$ M LS	2.3
Portal	$ M LS	0.7
Ventilation	$ M LS	11.5
Pumping	$ M LS	1.2
Power	$ M LS	1.2
Escapeway	$ M LS	2.3
Development (portal to ore)	$ M LS	26.0

Total capital expenditure breakdown is shown in Figure 9.1.

Figure 9.1 Capital works breakdown ($ M)



9.4 Operating costs

The LOM operating costs are estimated at $2,226.6 million for the CIL case or $2,712.8 million for the flotation case as listed in Table 9.6.

Table 9.6 LOM operating cost summary

Department	Unit	CIL (Case 1)	Flotation (Case 2)
Open pit	$ M	316.2	316.2
Underground	$ M	1,067.1	1,067.1
Processing/Other	$ M	843.3	1,329.5
Total	**$ M**	**2,226.6**	**2,712.8**

The makeup of these costs is described in the following sections.

9.4.1 Open pit operating

Open pit operating cost inputs for the Scoping Study Update were sourced from the Snowden Optiro database for similar scale fleet assumptions. These are summarised in Table 9.7 to Table 9.11.

Table 9.7 Drill and blast

Rock type	Unit	Drill and blast
Cover	$/bcm	-
Completely oxidised	$/bcm	1.50

Strongly oxidised	$/bcm	1.50
Partly oxidised	$/bcm	2.50
Fresh	$/bcm	3.00

Table 9.8 Load and haul

Item	Unit	Load and haul
Load and haul at surface	$/bcm	7.15
Load and haul incremental increase	$/bench	0.15

Table 9.9 Other mining

Item	Unit	Rate
Dayworks	%	1.5%
Dewatering	$/month	57,500

Table 9.10 Overheads - Owners technical staff

Item	Unit	Camp/FIFO number	Payroll ($,000)
Mining Manager	$,000/quarter	5.6	87
Senior Mining Engineer	$,000/quarter	5.6	69
Mining Engineer	$,000/quarter	5.6	56
Senior Geologist	$,000/quarter	5.6	69
Grade Control Geologists	$,000/quarter	5.6	43
Samplers	$,000/quarter	5.6	35
Surveyor	$,000/quarter	5.6	56
Surveyor offsider	$,000/quarter	5.6	35

Table 9.11 Miscellaneous

General Expenses	Unit	Rate	Frequency/quarter
Paint, tape etc. (Survey)	$,000/quarter	7.9	1
Prism plates, cables (Survey)	$,000/quarter	17.3	4
GPS poles, tripods (Survey)	$,000/quarter	17.3	4
Miscellaneous (Survey)	$,000/quarter	5.2	4
General consumables (Engineering)	$,000/quarter	0.7	1
Capital – minor (<$1,000)	$,000/quarter	5.2	4
Equipment hire	$,000/quarter	6.9	2
Licences and fees	$,000/quarter	27.6	4

9.4.2 Underground operating

Based on a M-SLC mining method, an all-in cost of $80/ore-tonne was assumed. This figure was validated against the Snowden Optiro database and undergrounds with a similar mining method and production rate. An additional estimate of $2.59 million has been added per level to account for haulage access, escapeways, ventilation, and services between levels.

Other operating

These are "ore" costs occurring including:

- Grade control
- Processing
- G&A
- Treatment charge (TC)/refining charge (RC) (flotation scenario only)

- Royalties.

A summary of the scenario based mine costs are presented by Table 9.12.

Table 9.12 Other operating costs

Item	CIL	Flotation
Processing	$20.78/t	$24.52/t
Processing – GEO-01	$17.81/t	
G&A	$1.49/t	$3.26/t
Grade control	$1.15/t	$1.15/t
Transport	-	US$234/dmt
TC (copper)	-	US$69/t
TC (cobalt)	-	US$133/t
RC (gold)	-	US$0.51/oz
RC (silver)	-	US$0.68/oz
RC (copper)	-	US$0.11/lb
RC (cobalt)	-	US$0.27/lb
Royalty	3.5%	6.0%

9.5 Revenue

The LOM revenues are estimated at $3,974.3 million for the CIL case or $4,291.7 million for the Flotation case as listed in Table 9.13.

Table 9.13 LOM revenue summary

Commodity	Unit	CIL	Flotation
Gold	$ M	3,959.8	3,560.2
Silver	$ M	14.5	5.9
Copper	$ M	-	507.0
Cobalt	$ M	-	218.6
Total	**$ M**	**3,974.3**	**4,291.7**

Revenue assumptions were established in conjunction with Antipa and benchmarked against similar operations. For the purposes of the optimisation, an A$ to US$ currency exchange rate of 0.70 was used. Adopted metal pricings for the Study are listed in Table 9.14.

Table 9.14 Metal prices and payabilities

Item	Unit	Prices		Payabilities	
		US$	A$	CIL	Flotation
Gold	$/oz	2,100	3,000	99.9%	92.5%
Silver	$/oz	24.5	35	99.9%	40.0%
Copper	$/t	8,952	12,789	-	93.8%
Cobalt	$/t	49,700	71,000	-	75.0%

10 Production and processing schedule options

The scenarios evaluated are summarised in Table 10.1. Each scenario was tested for the CIL processing option and the flotation processing option.

Table 10.1 Scenarios tested (CIL and flotation)

Scenario	Process capacity (Mtpa)	Open pit size (Mt mill feed)	Underground production rate (Mtpa)	Open pit/ Underground sequence	Comment
1	1.0	Stage 2	1.0	Minyari open pit, then underground	Discounted due to high processing cost rate and both open pit and underground mine could support a higher processing rate
2	2.0	Stage 2	2.0	Minyari open pit, then underground	Underground portal at the base of Minyari pit
3	3.0	Stage 2	2.0	Minyari open pit, then underground	Less upfront establishment
3a	3.0	Stage 2	2.0	Minyari open pit, WACA open pit, then underground	Underground brought forward to support larger mill capacity
3b	3.0	Stage 2	2.0	Minyari open pit, Minyari South open pit, then underground	Allows underground to be brought further forward
3c	3.0	Stage 3	2.0	Minyari open pit, then underground	
3d	3.0	Stage 4	-	-	No underground with a larger three stage pit

Other smaller iterations were considered but were discounted due to either increasing costs and / or deferred revenue. Processing method options for CIL to extract gold and silver, or flotation to extract the additional copper and cobalt were tested for all scenarios. No constraints were applied to stockpiling of mill feed material.

Production and processing scenarios were developed for each scenario with the objective to test the value of the two process plant options (CIL and flotation) at throughput rates of 1.0, 2.0 and 3.0 Mtpa. Scenarios tested were the scale of the open pit and the sequence of the open pit to underground transition.

The physicals for each scenario are summarised in Table 10.2. The cash flow summaries for each scenario for CIL and flotation are provided in Table 10.6 and Table 10.7, respectively.

Table 10.2 Physicals for each scenario

Scenario	Unit	1	2	3	3a	3b	3c	3d
		1 Mtpa	2 Mtpa	3 Mtpa	3 Mtpa	3 Mtpa	3 Mtpa	3 Mtpa
Open Pit Waste	kt	79,314	79,314	79,314	79,314	79,314	144,097	252,471
Open Pit Ore	kt	17,485	17,485	17,485	17,485	17,485	25,378	33,010
Total	kt	96,800	96,800	96,800	96,800	96,800	169,476	285,481
Strip ratio	wt:ot	4.5	4.5	4.5	4.5	4.5	5.7	7.6
Underground	kt	9,000	12,757	12,757	12,757	12,757	8,984	0
Processing								
Ore	kt	13,750	27,500	30,242	30,242	30,242	34,362	33,010
Gold	g/t	2.11	1.61	1.52	1.52	1.52	1.40	1.30
Silver	g/t	0.58	0.49	0.48	0.48	0.48	0.45	0.42
Copper	%	0.22	0.19	0.18	0.18	0.18	0.17	0.17
Cobalt	%	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Indicated classification	%	86	79	79	79	79	83	0
Gold	koz	933	1,425	1,476	1,476	1,476	1,551	1,383
Silver	koz	255	437	463	463	463	496	444
Copper	kt	31	52	55	55	55	59	55
Cobalt	kt	4	8	9	9	9	10	10
CIL								
Gold	koz	834	1,275	1,321	1,321	1,321	1,389	1,240
Silver	koz	228	392	415	415	415	444	399
Flotation								
Copper concentrate	kt	152	250	264	264	264	285	262
Grade	%	16	16	16	16	16	16	16
Metal	t	24,331	39,988	42,263	42,263	42,263	45,610	41,871
Cobalt concentrate	kt	21	40	41	41	41	47	47
Grade	%	10	10	10	10	10	10	10
Metal	t	2,096	3,793	4,105	4,105	4,105	4,675	4,671

Table 10.3 Scenario 3 - cash flow results for CIL

Scenario	Unit	1	2	3	3a	3b	3c	3d
Revenue	$ M	2,509	3,835	3,974	3,974	3,974	4,177	3,731
Capital	$ M	173	222	277	279	277	280	241
Open pit mining	$ M	444	438	439	438	439	782	1,292
Underground mining	$ M	741	1,067	1,067	1,067	1,067	747	0
Processing	$ M	450	659	624	625	627	712	680
Other	$ M	165	227	219	219	219	237	218
AIC	$ M	1,797	2,347	2,326	2,291	2,298	2,415	2,105
AIC/oz	$/oz	2,154	1,841	1,760	1,734	1,740	1,740	1,697
Pre-tax								
FCF	$ M	536	1,222	1,348	1,346	1,346	1,418	1,300
DCF	$ M	229	686	834	853	860	845	672
IRR	%	21	41	52	51	52	42	31
Post-tax								
FCF	$ M	404	884	972	971	970	1,021	939
DCF	$ M	166	492	598	609	614	599	476
IRR	%	19	36	46	44	45	36	27

Table 10.4 Scenario 3 - cash flow results for flotation

Scenario	Unit	1	2	3	3a	3b	3c	3d
Revenue	$ M	2,668	4,128	4,292	4,292	4,292	4,540	4,067
Capital	$ M	199	273	346	349	346	350	311
Open pit mining	$ M	444	438	439	438	439	782	1,292
Underground mining	$ M	741	1,067	1,067	1,067	1,067	747	0
Processing	$ M	784	1,068	1,000	1,000	1,000	1,130	1,082
Other	$ M	233	334	330	330	330	355	324
AIC	$ M	2,200	2,864	2,814	2,778	2,784	2,953	2,614
AIC/Eq oz	$/eq oz	2,474	2,081	1,967	1,942	1,946	1,951	1,928
Pre-tax								

FCF	$ M	267	949	1,109	1,108	1,109	1,176	1,059
DCF	$ M	51	495	650	666	675	658	505
IRR	%	10	29	37	37	38	32	24
Post-tax								
FCF	$ M	215	693	805	804	805	852	770
DCF	$ M	30	352	464	472	479	462	351
IRR	%	9	25	33	31	33	27	21

Cumulative DCF results are shown for CIL and Flotation in Figure 10.5 and Figure 10.6

Figure 10.1 Cumulative DCF curves for CIL scenarios

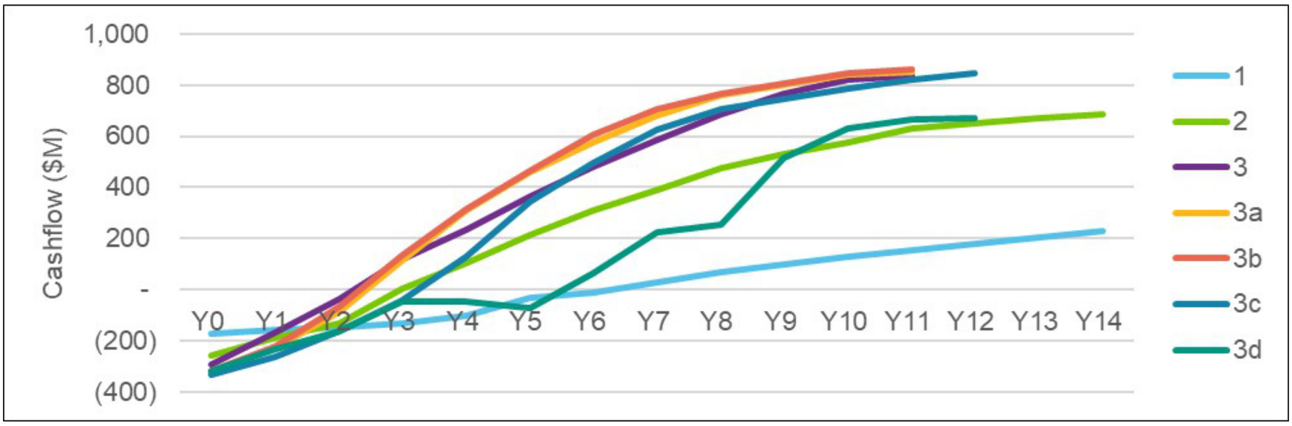
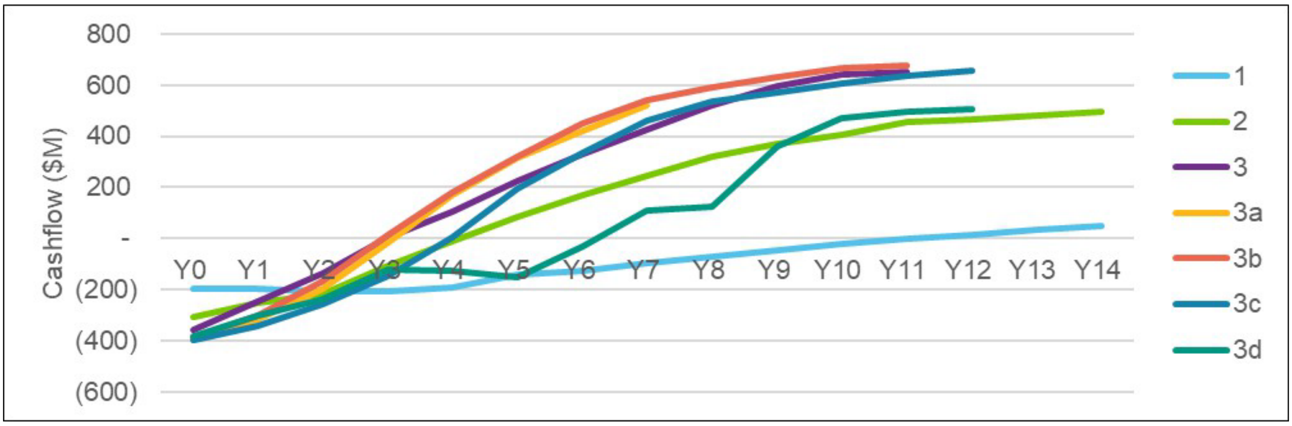


Figure 10.2 Cumulative DCF curves for flotation scenarios



10.1 Selected scenario

Scenario 3 (CIL) was selected as the preferred scenario to take forward for the following reasons:

- It provides one of the highest DCF values and is within 3% of the maximum value of all scenarios.
- It has a lower risk of implementation, with the underground mine commencing in Year 4.
- It has the highest IRR and shortest payback period.
- It has the highest undiscounted value option, regardless of processing method (CIL or flotation).

A summary of the financial results for Scenario 3 (CIL) are:

- A LOM of eleven years.
- 30.2 Mt at 1.52 g/t gold and 0.48 g/t silver and 1.5 Moz gold and 500 koz silver processed.
- An AISC of A$1,722/oz or US$1,205/oz (excluding Y0 pre-production open pit mining and underground capital development to reach the top of the Minyari orebody).
- A DCF of $832 million pre-tax and $598 million post-tax.

- An IRR of 52% pre-tax and 46% post-tax.
- A short payback period of 2.0 years post preproduction, and a maximum cash drawdown of $306 million (on an annualised cash flow basis).

The mining physicals scheduled in Scenario 3 are reported in Table 10.5 and Table 10.6. Note the mined physicals are the same for both the CIL and flotation processing routes.

Table 10.5 Summary mined physicals for Scenario 3 (Y0 to Y5)

	Unit	Total	Y0	Y1	Y2	Y3	Y4	Y5
Waste	kt	79,314	17,365	27,239	17,389	12,974	4,347	-
Ore	kt	17,485	2,635	2,761	3,861	5,776	2,452	-
Total	**kt**	96,800	20,000	30,000	21,250	18,750	6,800	-
Strip ratio	x	4.5	7	10	5	2	2	-
Underground	kt	12,757	-	-	-	-	1,000	2,000
Processing		-						
Ore	kt	30,242	-	2,250	3,000	3,000	3,000	3,000
Gold	g/t	1.57	-	1.77	1.31	1.53	1.39	1.69
Silver	g/t	0.49	-	0.43	0.47	0.57	0.39	0.45
Indicated % by tonnes	%		-	83	88	88	91	77
Gold	koz	1,476	-	128	127	148	134	163
Silver	koz	463	-	31	46	55	38	43
Copper	kt	55.0	-	4.6	5.7	6.3	4.6	5.6
Cobalt	kt	8.7	-	1.3	1.2	1.3	0.9	0.6

Table 10.6 Summary mined physicals for Scenario 3 (Y6 to Y11)

	Unit	Y6	Y7	Y8	Y9	Y10	Y11
Waste	kt	-	-	-	-	-	-
Ore	kt	-	-	-	-	-	-
Total	**kt**	-	-	-	-	-	-
Strip ratio	x	-	-	-	-	-	-
Underground	kt	2,000	2,000	2,000	2,000	1,757	-
Processing							
Ore	kt	3,000	3,000	3,000	3,000	3,000	992
Gold	g/t	1.65	1.61	1.67	1.58	1.34	0.59
Silver	g/t	0.49	0.54	0.55	0.57	0.35	0.29
Indicated % by tonnes	%	82	94	95	91	34	-
Gold	koz	159	155	161	152	129	19
Silver	koz	47	52	53	55	33	9
Copper	kt	5.4	6.2	5.8	5.8	3.9	1.2
Cobalt	kt	0.7	0.7	0.6	0.6	0.6	0.2

The cashflow details for Scenario 3 (CIL) are summarised in Table 10.7 and Table 10.8.

Table 10.7 Summary cash flow details for Scenario 3 (Y0 to Y5)

Item	Unit	Total	Y0	Y1	Y2	Y3	Y4	Y5
Revenue	$ M	3,974	-	347	344	402	361	436
Capital – growth	$ M	(261)	(210)	(6)	-	-	-	-
Capital – sustaining	$ M	(16)	-	(3)	(4)	(41)	(12)	-
Open pit mining	$ M	(439)	(90)	(134)	(107)	(81)	(27)	-

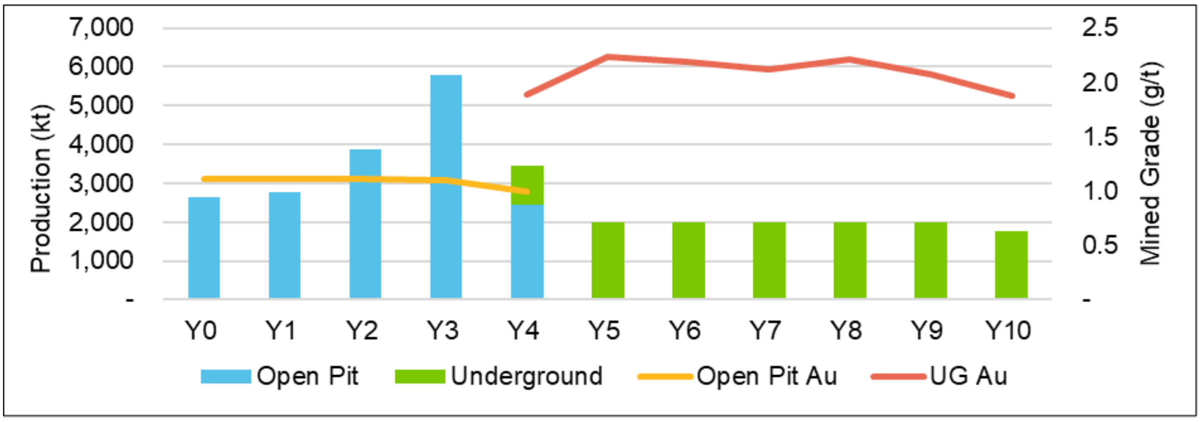
Underground mining	$ M	(1,067)	-	-	-	-	(85)	(163)
Processing	$ M	(624)	-	(47)	(62)	(62)	(59)	(62)
Other	$ M	(219)	-	(18)	(20)	(22)	(21)	(23)
AISC	*$ M*	(2,366)	(90)	(202)	(194)	(205)	(204)	(248)
AISC/oz	*$/oz*	1,722	-	1,751	1,693	1,536	1,702	1,709
AIC	*$ M*	(2,627)	(301)	(208)	(194)	(205)	(204)	(248)
AIC/oz	*$/oz*	1,760	-	1,801	1,693	1,536	1,702	1,709
Pre-tax								
FCF	$ M	1,348	(301)	139	151	197	157	188
DCF	$ M	834	(291)	125	128	156	117	131
Post-tax								
FCF	$ M	972	(301)	139	151	170	110	132
DCF	$ M	598	(291)	125	128	134	82	92

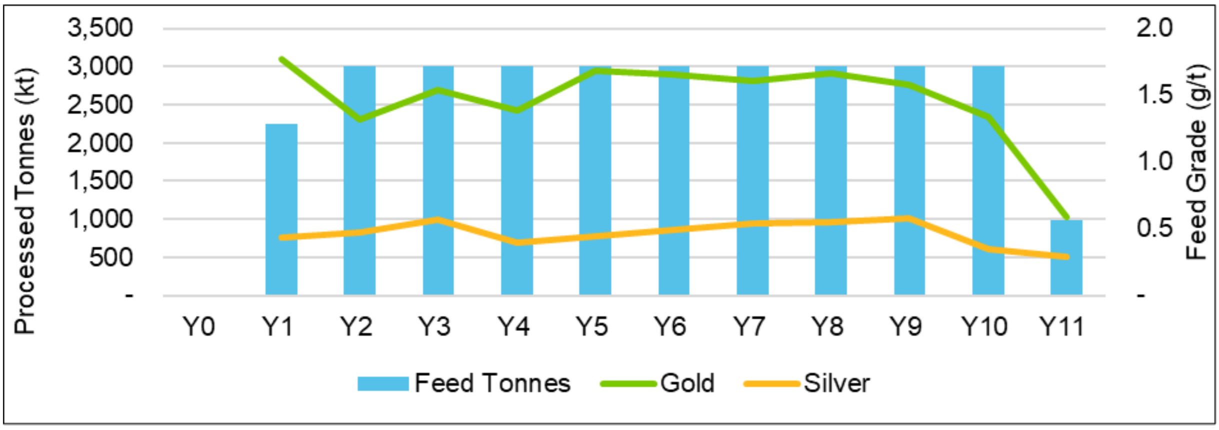
Table 10.8 Summary cash flow details for Scenario 3 CIL (Y6 to Y11)

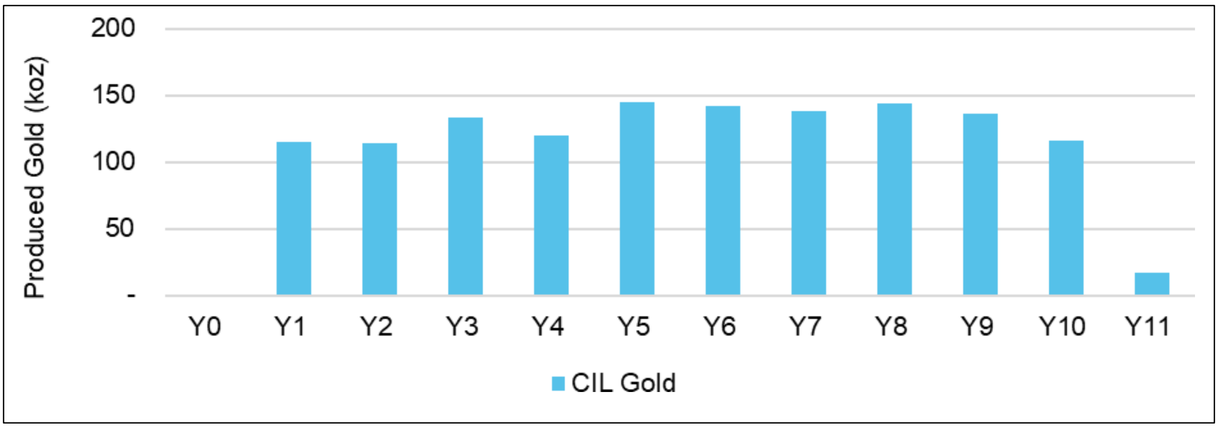
Item	Unit	Y6	Y7	Y8	Y9	Y10	Y11
Revenue	$ M	428	417	432	409	347	51
Capital – growth	$ M	-	-	-	-	-	-
Capital – sustaining	$ M	-	-	-	-	-	-
Open pit mining	$ M	-	-	-	-	-	-
Underground mining	$ M	(163)	(165)	(165)	(173)	(153)	-
Processing	$ M	(62)	(62)	(62)	(62)	(62)	(21)
Other	$ M	(23)	(23)	(23)	(22)	(20)	(4)
AISC	*$ M*	(248)	(250)	(251)	(258)	(236)	(25)
AISC/oz	*$/oz*	1,743	1,804	1,746	1,896	2,042	1,475
AIC	*$ M*	(248)	(250)	(251)	(258)	(236)	(25)
AIC/oz	*$/oz*	1,743	1,804	1,746	1,896	2,042	1,475
Pre-tax							
FCF	$ M	180	167	181	151	111	26
DCF	$ M	117	101	103	80	55	12
Post-tax							
FCF	$ M	126	117	127	106	78	18
DCF	$ M	82	71	72	56	39	9

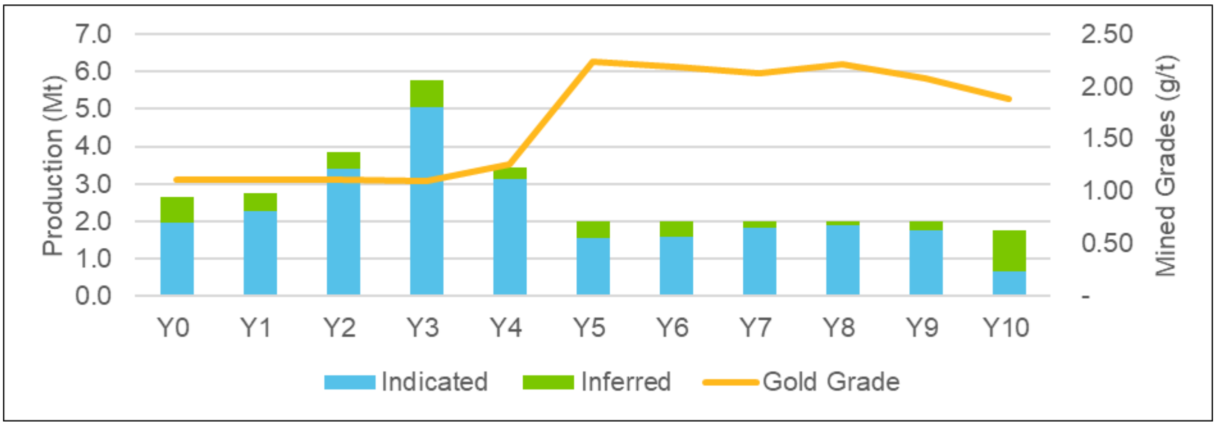
Production charts for the open pit and underground mining schedule (including breakdown by Mineral Resource classification) and processing physicals are displayed in Figure 10.3.

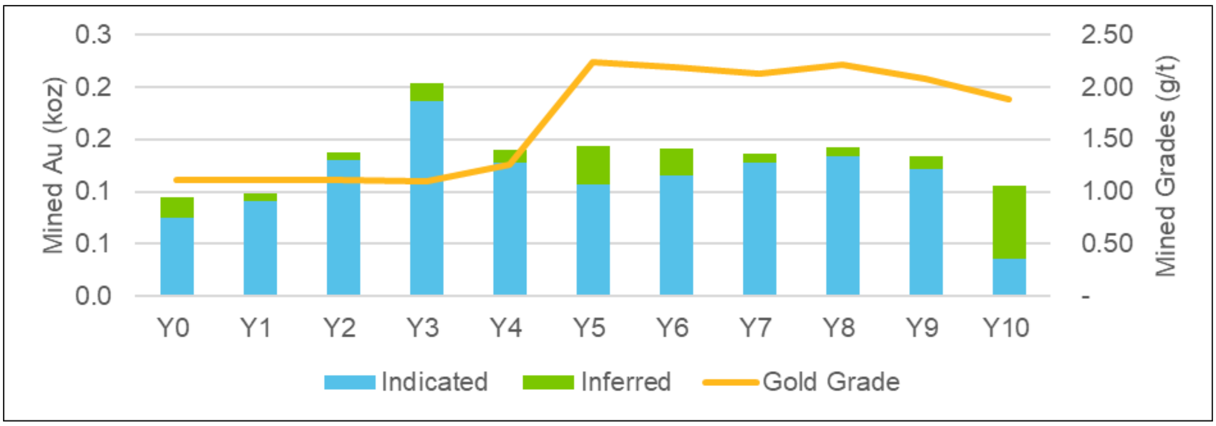
Figure 10.3 Scenario 3 CIL production profile





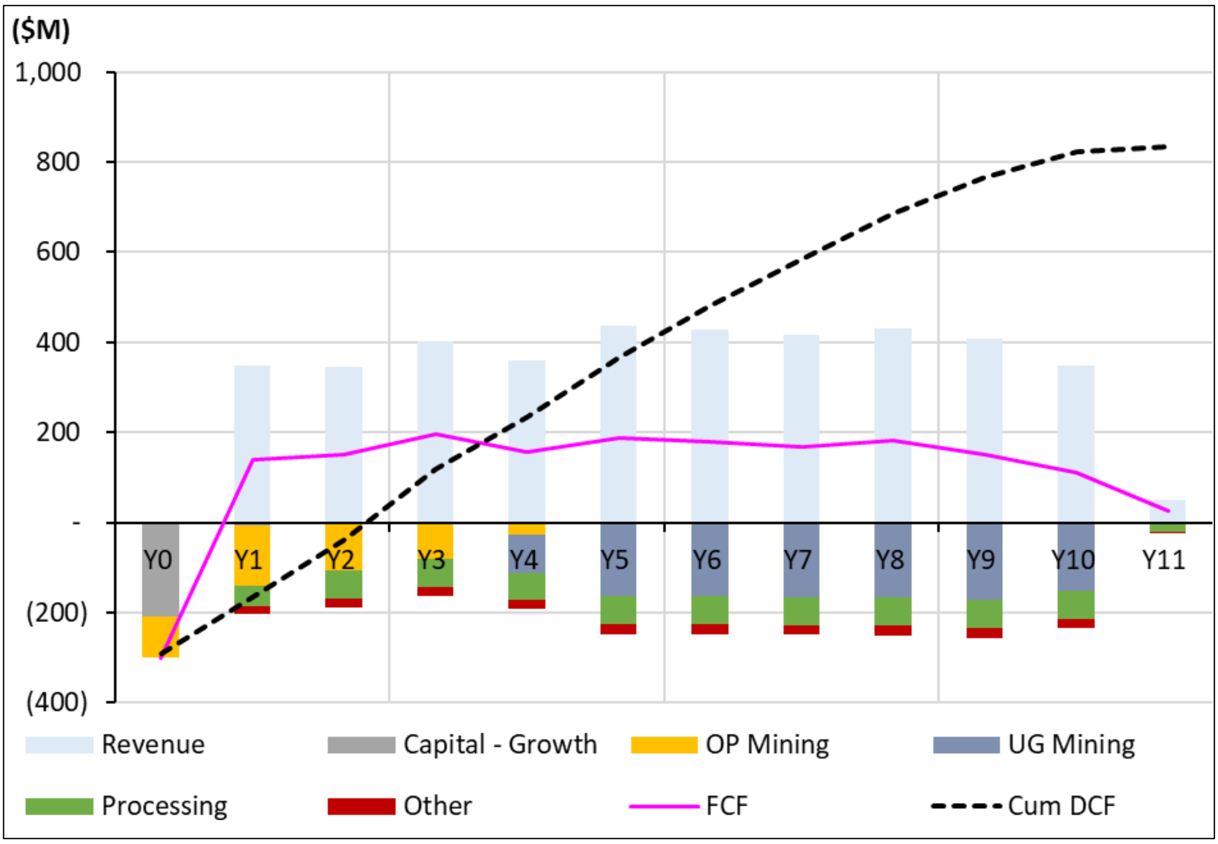






Cost, revenue and cash flow results for Scenario 3 CIL are shown in Figure 10.4.

Figure 10.4 Scenario 3 CIL annual pre-tax FCF and cumulative DCF



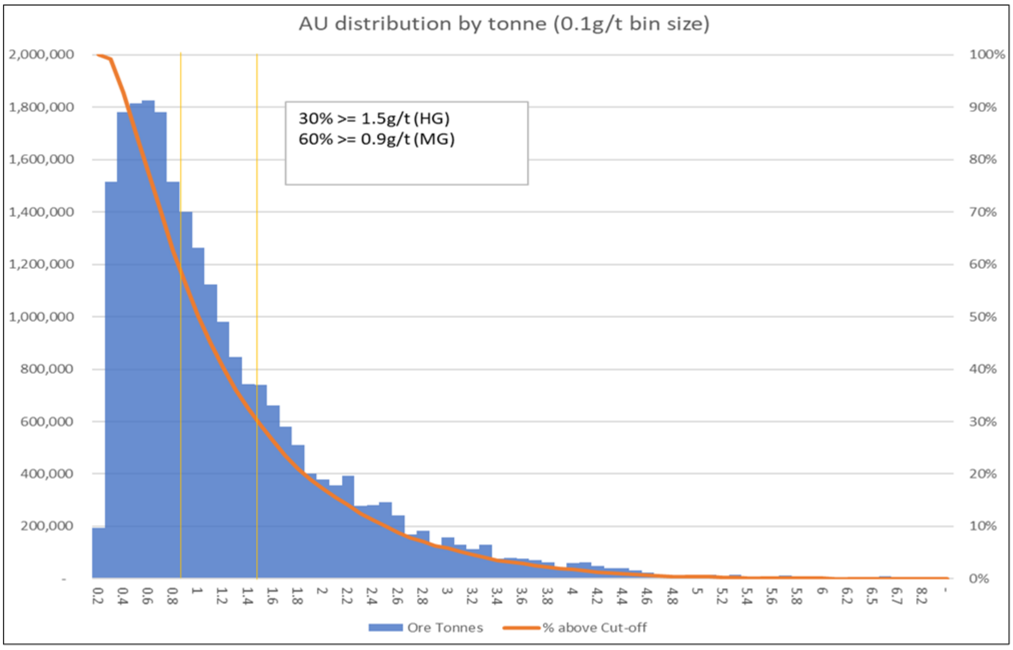
10.2 Scenario 3 (CIL) production and process schedules

The following section provides more detail of the preferred option, scenario 3 CIL. Other scenarios were run at the same level of detail for the Study, but for brevity and clarity of this report these results are not discussed further in this report.

10.2.1 Grade bins

On inspection of the grade distribution within the pit inventories, grade bins were selected to split the mill feed material into three similar sized tonnages (Figure 10.5).

Figure 10.5 Gold grade distribution within the pit designs



The following grade bins were selected based on gold grade:

- Waste below economical cut-off (0.3 g/t).
- "Low Grade" (LG) less than 0.9 g/t.
- "Medium Grade" (MG) between 0.9 to 1.2 g/t.
- "High Grade" (HG) greater than 1.2 g/t.

As the Study used a very simplistic stockpiling selection model, there is an opportunity in future studies to further optimise the grade bins and selection timing to further improve project value.

10.2.2 Mining inventory

Mine inventories including Indicated and Inferred classified material were generated using:

- Open pit:
  - Interrogated using pit designs.
  - Mining dilution and ore loss generated using the dilution model (no additional factors added).
  - Lower economic cut-off grade applied based on material type for the preferred processing plant size (3 Mtpa) and ranging from 0.30 g/t to 0.32 g/t Au.
- Mill feed streams split into:
  - "Low Grade" (LG) between 0.3 g/t and 0.9 g/t.
  - "Medium Grade" (MG) between 0.9 g/t and 1.2 g/t.
  - "High Grade" (HG) greater than 1.2 g/t.
- Underground:
  - Interrogated from stope wireframes generated using MSO.
  - Dilution of 5% in addition to 1.0 m diluted width included in MSO inventory.
  - Ore loss of 10%.

Open pit inventory is tabled by material destination in Table 10.9.

Table 10.9 Open pit total movement quantities (selected case)

Pit/ Destination	Volume (Mbcm)	Tonnes (Mt)	Mill feed (kt)	Au (g/t)	Ag (g/t)	Cu (%)	Co (%)	Au (koz)	Ag (koz)	Cu (t)	Co (t)
Minyari Stage 1 (incl. Minyari South)											
Waste	5.4	12.2	-	-	-	-	-	-	-	-	-
HG	0.5	1.2	1,205	2.3	0.5	0.22	0.07	88	18	2,632	822
MG	0.5	1.4	1,371	1.2	0.4	0.19	0.04	51	18	2,601	602
LG	1.0	2.5	2,470	0.6	0.3	0.13	0.03	45	23	3,313	702
Total	7.3	17.2	5,045	1.1	0.4	0.17	0.04	185	59	8,546	2,126
Minyari Stage 2											
Waste	20.6	53.3	-	-	-	-	-	-	-	-	-
HG	0.7	2.1	2,069	2.4	0.7	0.25	0.05	160	45	5,192	1,071
MG	1.0	2.9	2,869	1.1	0.5	0.20	0.04	105	50	5,608	1,276
LG	1.6	4.4	4,413	0.6	0.4	0.15	0.03	89	58	6,740	1,458
Total	23.9	62.6	9,351	1.2	0.5	0.19	0.04	354	153	17,540	3,805
WACA Stage 1											
Waste	2.5	5.8	-	-	-	-	-	-	-	-	-
HG	0.0	0.1	66	1.9	0.2	0.14	0.02	4	0	93	12
MG	0.1	0.3	273	1.1	0.2	0.12	0.02	9	2	325	49
LG	0.3	0.7	717	0.6	0.1	0.09	0.02	14	3	618	120
Total	3.0	6.9	1,057	0.8	0.2	0.10	0.02	27	5	1,036	182
GEO-01 (North and South)											
Waste	3.6	8.1	-	-	-	-	-	-	-	-	-
HG	0.1	0.1	140	2.3	0.0	0.01	0.00	10	0	17	3
MG	0.1	0.3	292	1.1	0.1	0.02	0.00	10	1	53	6
LG	0.6	1.6	1,600	0.5	0.1	0.03	0.00	26	4	554	42
Total	4.4	10.1	2,032	0.7	0.1	0.03	0.00	47	5	624	51
Total Open Pit Inventory	**38.5**	**96.8**	**17,485**	**1.1**	**0.4**	**0.16**	**0.04**	**613**	**222**	**27,746**	**6,164**

Table 10.10 Resource classification by mining area (open pit and underground)

Open Pit	Resource Classification	Mill feed (kt)	Au (g/t)	Ag (g/t)	Cu (%)	Co (%)	Au (koz)	Ag (koz)	Cu (t)	Co (t)
Minyari Stage 1	Indicated	4,026	1.2	0.4	0.19	0.05	160	52	7,578	1,918
	Inferred	1,019	0.8	0.2	0.09	0.02	25	7	968	208
	Total	**5,045**	**1.1**	**0.4**	**0.17**	**0.04**	**185**	**59**	**8,546**	**2,126**
Minyari Stage 2	Indicated	8,166	1.3	0.5	0.20	0.04	328	143	16,373	3,469
	Inferred	1,185	0.7	0.2	0.10	0.03	26	9	1,167	336
	Total	**9,351**	**1.2**	**0.5**	**0.19**	**0.04**	**354**	**153**	**17,540**	**3,805**
WACA Stage 1	Indicated	996	0.8	0.2	0.10	0.02	26	5	993	175
	Inferred	60	0.6	0.2	0.07	0.01	1	0	43	7
	Total	**1,057**	**0.8**	**0.2**	**0.10**	**0.02**	**27**	**5**	**1,036**	**182**
GEO-01 (North & South)	Indicated	1,832	0.7	0.1	0.03	0.00	44	5	576	46
	Inferred	200	0.5	0.1	0.02	0.00	3	0	48	5
	Total	**2,032**	**0.7**	**0.1**	**0.03**	**0.00**	**47**	**5**	**624**	**51**
Subtotal – open pit		**17,485**	**1.1**	**0.4**	**0.16**	**0.04**	**613**	**222**	**27,746**	**6,164**
Minyari Underground	Indicated	9,617	2.2	0.6	0.23	0.02	667	199	22,165	2,126
	Inferred	2,098	2.1	0.5	0.17	0.01	143	30	3,512	242
Subtotal – underground		**11,715**	**2.2**	**0.6**	**0.22**	**0.02**	**810**	**230**	**25,677**	**2,368**
All areas	**Indicated**	**24,638**	**1.5**	**0.5**	**0.19**	**0.03**	**1,225**	**404**	**47,685**	**7,735**
	Inferred	**4,563**	**1.4**	**0.3**	**0.13**	**0.02**	**198**	**48**	**5,738**	**797**
Total		**29,200**	**1.5**	**0.5**	**0.18**	**0.03**	**1,423**	**452**	**53,423**	**8,532**

10.2.3 Product schedule

Regardless of the processing method, all four elements (gold, silver, copper, cobalt) were carried through to the products. Depending on the processing method (CIL or Flotation), the relevant processing recoveries and metal pricing were applied to obtain the annual revenue for the cash flow model. Product schedules for the selected case are shown in Figure 10.6 to Figure 10.8.

Figure 10.6 Product schedule for CIL (Case 1) at 3 Mtpa and selected mining case

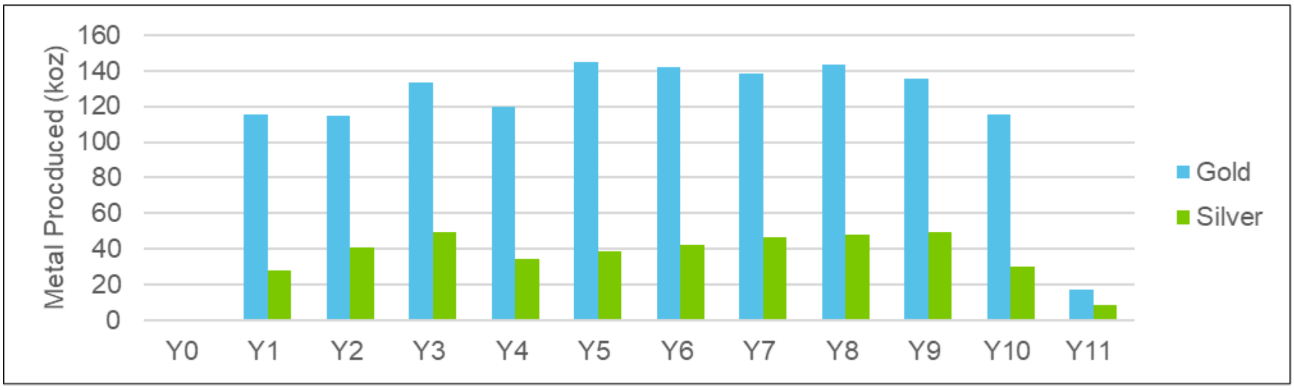


Figure 10.7 Gold and silver product schedule for flotation (Case 2) at 3 Mtpa and selected mining case

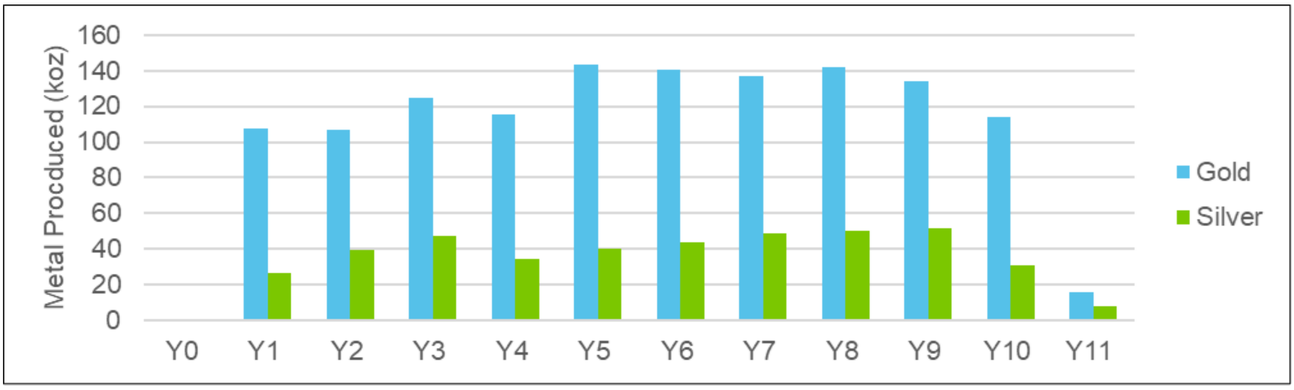
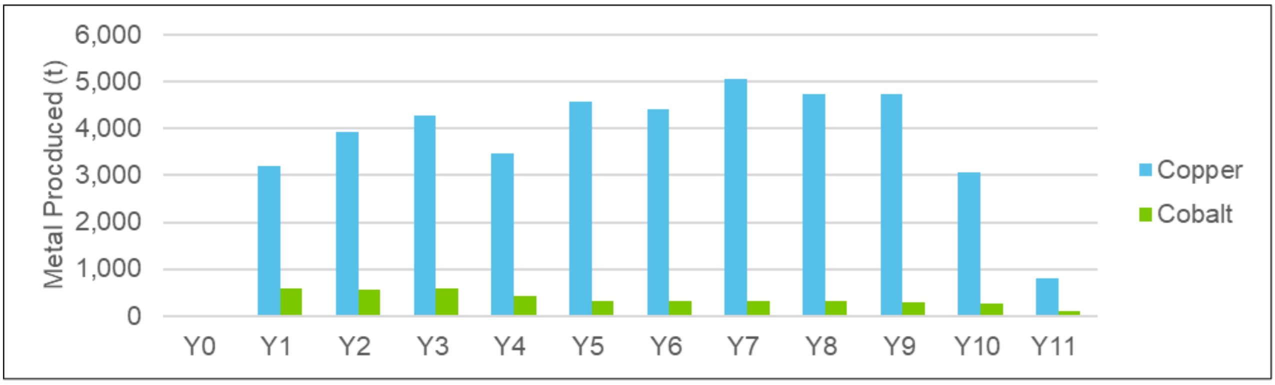


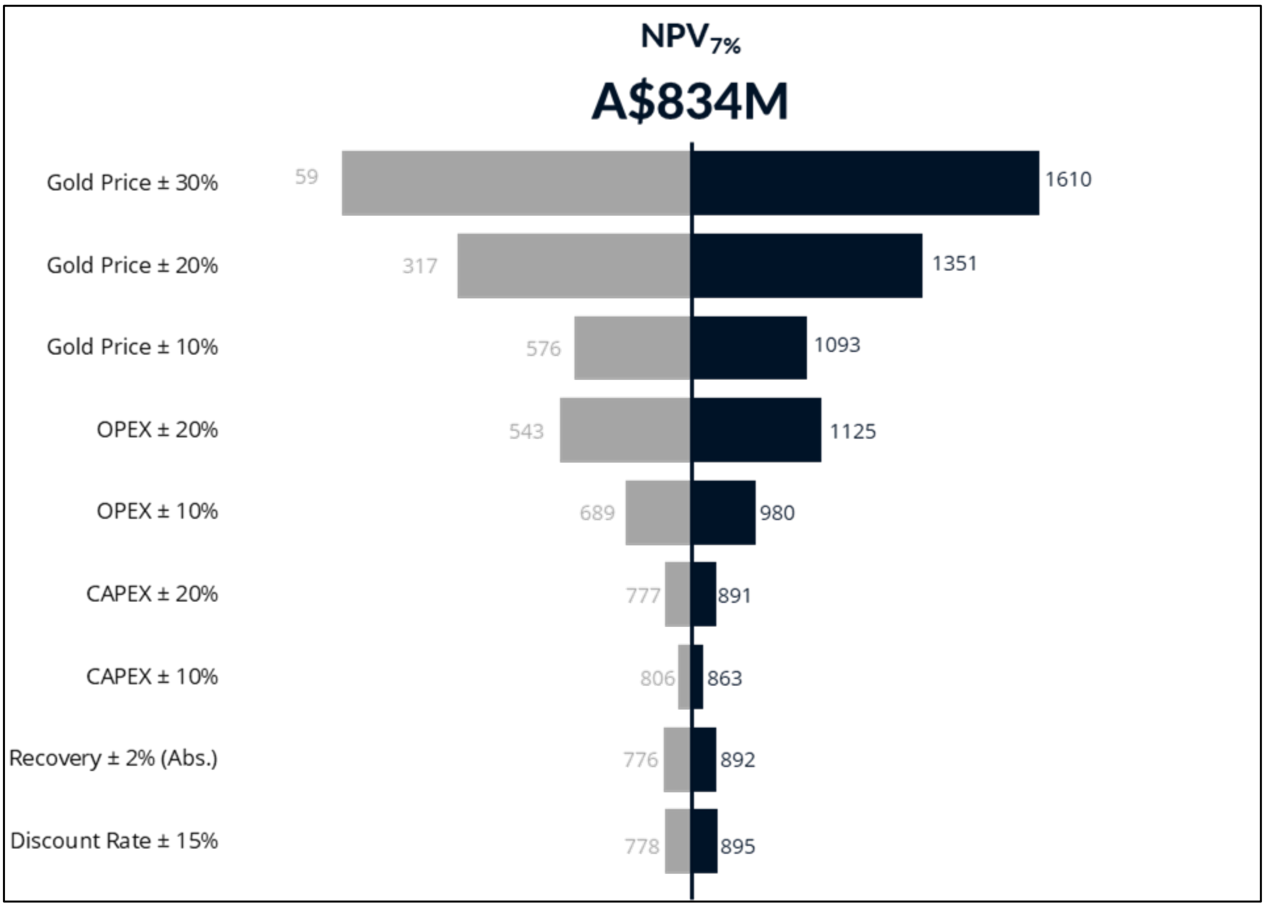
Figure 10.8 Copper and cobalt product schedule for flotation (Case 2) at 3 Mtpa and selected mining case



11 Sensitivities

Sensitivity analysis was generated for the LOM DCF for the preferred scenario. Variances of metal pricing and operating cost having similar impact the Project value. Less sensitivity was shown for the variation of the capital costs. The Project returned a positive DCF for the ±20% variances. Results shown in Figure 11.1.

Figure 11.1 Minyari Dome Project NPV7% A$834M (pre-tax, A$M discounted) sensitivity analysis



12 Discussion of results, conclusions and recommendations

Cash flow modelling of the selected scenarios provided the following observations:

- Multiple mining areas are required to sufficiently match the larger processing rate (3 Mtpa). This would be achieved by either mining larger pits (Stage 3 or 4) with multiple stages or having a suitable stockpile to supplement the mill feed with underground mining.
- The lowest operating cost is achieved by establishing the 3.0 Mtpa processing plant.
- To takes advantage of the high ore supply rates achievable by the open pit stockpiling strategy, where higher grades are preferentially processed while lower grade ore is stockpiled, allows for revenue to be brought forward while deferring processing of lower margin material. This improves project value.
- Some incremental gains may be achieved by moving the underground mine forward; however, this would be at a greater upfront capital cost.

12.1 Risks and opportunities

A summary of key risks and opportunities identified to date are described below.

12.1.1 Risks

The Scoping Study Update referred to in this report is based on low-level technical and economic assessments of Indicated and Inferred Mineral Resources and is insufficient to support estimation of Ore Reserves or to provide assurance of an economic development case at this stage, or to provide certainty that the conclusions of the Scoping Study Update will be realised.

Study accuracy

Initial scoping studies inherently carry the risk of limitations due to the accuracy of the assessment. Progressing the Project through each study phase step will be important to both fully understand the cost of investment and maximum possible potential of the Project.

A large component of the Mineral Resources underpinning the Study are of an Indicated classification with 85% in the first four years and 83% over the LOM.

Project timeline and ramp up

Similar to the majority of unestablished projects, project NPV is closely linked to duration of the initial project development and commencement date. The preferred scenario provides the least exposure to initial capital cost having the least payback period, and highest IRR. It requires the establishment of the site, processing plant and infrastructure, as well as an open pit at the start of the project. Then transitions to an underground operation in year four. Detailed implementation and execution planning will be critical to reducing any start-up delays.

Development Funding

The Updated Scoping Study outlines a potential future development of the Minyari Dome Project that is considered low risk and technically straightforward, with very strong economic fundamentals, providing a solid foundation for sourcing traditional financing from debt and equity markets. Antipa plans to initiate discussions with potential financiers during the next stage of technical analysis and intends to appoint a debt advisor. However, there is no guarantee that funding will be available when required.

To achieve the various outcomes outlined in the Updated Scoping Study, pre-production funding of up to A$306 million on an annualised cash flow basis may be required. Typically, development financing would include a mix of debt and equity. Antipa has formed the view that there is a reasonable basis to expect that the requisite funding for future development of the Minyari Dome Gold Project will be available, based on the following factors:

- The Project is 100%-owned, located in a tier-one jurisdiction, with simple, non-refractory metallurgy enabling an industry-standard CIL process plant and offering a rapid payback period of only two years from the start of commercial production. These factors are expected to reduce funding complexity significantly.
- Even with a conservative gold price forecast of A$3,000 per ounce (approximately 37% below the 23 October spot price of approximately A$4,100/oz), the Project's robust post-tax cashflows of A$972 million and rapid payback period make it a strong candidate for conventional debt financing. Key financial metrics, including a pre-tax NPV_7% of A$834 million and an IRR of 52%, further enhance its attractiveness to potential financiers.
- Significant potential exists for growth in the Project's Mineral Resource base, which forms the basis of the Updated Scoping Study. The recently commenced CY2024 Phase 2 exploration programme is designed to test a range of gold-silver, copper, cobalt extensional targets and prospect areas. Many of these targets are located within 1.5 km of the Minyari deposit. The key objective of this programme is to increase the overall size of the existing MRE, which could reasonably be expected to further strengthen the Project's economics.

- The anticipated completion this month of Antipa's A$17 million all-cash sale of its interest in the Citadel Joint Venture Project to Rio Tinto will boost Antipa's cash reserves to approximately A$23 million, providing a strong financial foundation for the ongoing development of the Project.
- The Company has a proven track record of raising equity funds as and when required to support the exploration and evaluation of its assets.
- Antipa's Board and management bring extensive experience in mine development, financing and production within Western Australia's resource sector.

12.1.2 Opportunities

Early ore exposure

Minyari pit initial Stage 1 provides a low strip ratio allowing early access to ore feed and ability to defer capital pre-strip.

Stockpile management

Stockpile management shows significant improvement to the project NPV using a simplistic scoping level assessment. Opportunity to use more advanced methods, to further optimise the mined grade intervals and target mill feed grade, particularly during the start-up period.

Mineral Resource growth

Further extending the potential Project LOM via additional Mineral Resource growth, including brownfield and greenfield open pit and underground opportunities, would further enhance the Project's NPV and IRR.

Extending the potential Project LOM by two or more years via further Mineral Resource growth, including the satellite open pit and Minyari, WACA and satellite underground opportunities, would materially enhance the Project's NPV and IRR. Further exploration success across the Minyari Dome Project delivers the potential to push-ack the final two years of low-grade stockpile processing.

Base metal production – copper and cobalt

The Project's future facing base metals copper and cobalt represent significant in-situ value and although the Study's optimum development case was the precious metal gold-silver only scenario, further base metal focused metallurgical testwork may determine improved processing operational performance, such as base metal recoveries and concentrate product specifications, potentially highlighting alternative viable Project development options. It is noteworthy that the Australian Government's critical minerals list (March 2022) includes cobalt, and that the Australian Government is committed to building a pipeline of critical minerals projects via various mechanisms including incentive programmes such as the Critical Minerals Facility, Critical Minerals Accelerator Initiative (**CMAI**), and Modern Manufacturing Initiative (**MMI**).

12.2 Recommendations

The purpose of the Minyari Dome Project Scoping Study Update was to provide a broad range of options, to provide direction for future economic assessments at greater levels of accuracy.

The Study has provided a positive economic solution for the Project with the following results:

- Life of mine (LOM) of eleven (10+) years.
- 30.2 Mt mining inventory grading 1.5 g/t gold and 0.5 g/t silver for 1.48 Moz of gold and 463 koz of silver.
- All-in Sustaining Cost (AISC) of A$1,722/oz or US$1,205/oz (excluding Y0 pre-production open pit mining and underground capital development to reach the top of the Minyari orebody).
- All-in Cost (AIC) of A$1,760/oz or US$1,232/oz (including pre-production open pit mining and underground capital development to reach the top of the Minyari orebody).
- DCF of $834 million pre-tax and $598 million post-tax.

- Internal rate of return (IRR) of 52% pre-tax and 46% post-tax.
- Payback (2.0 years) following the 18-month preproduction period.
- Maximum drawdown of $306 million on an annualised cash flow basis.

The Study has provided the following key learnings to assist in future study work:

- The orebody, in terms of possible mining production rates, readily supports a 2 Mtpa capacity processing plant.
- With multiple mining areas (open pit or underground), the mine could support a 3 Mtpa capacity processing plant.
- Pit optimisation results indicated the orebody exhibits significant strip ratio steps, indicating suitable locations for pit stages and suitable transition depth for open pit to underground.
- Cash flow modelling shows significant early value in stockpile management providing feed grades of greater than 40% in the first three years compared to the LOM average grade.
- Maximum cash flows were achieved by maintaining a higher grade feed through the life of the project. This will require suitable high grade bins to be separated from the open pit operation, and have the underground mine commence as soon as the Minyari Stage 2 is completed.
- This study shows the suitable cross over point for the Minyari open pit to underground is achieved at the base of the stage 2 pit (approximate depth 280 vertical metres below the surface).

12.3 Future work

To progress the Project to a PFS level, Snowden Optiro has highlighted following items which would form a typical study programme (but not limited to):

- Inferred Mineral Resource conversion to Indicated Mineral Resource to inform the overall scale and continuity of the underground resource.
- Further geotechnical drilling of the preferred pit outline to confirm rock types and any structures impacting the open pit wall positions and inform batter and berm dimensions.
- Further hydrology assessment to inform any flood diversion structures.
- Hydrogeology assessment to inform dewatering strategy, water balances, and support geotechnical analysis.
- Waste rock storage considerations including geochemical and material properties testwork.
- Further metallurgical and other processing and metal recovery testwork assessments to increase the level of detail.
- Mining method assessment.
- Equipment selection – open pit.
- Equipment selection – underground.
- Underground ventilation assessment.
- Power supply options analysis.
- Detailed infrastructure cost estimation.
- Detailed operating cost estimation.
- Environmental clearances and impact assessments.
- Project risk assessment.

Appendix 1

Process Design Report Addendum
- October 2024

Title	**Addendum to "AT Process Package Report_20220801_Rev 1"**
Revision	Rev 0
Date	15th October 2024
Author(s)	Nick Vines / Neil Ireland
Client	Antipa Minerals Limited

INTRODUCTION

Victoria Lawns, representing Antipa Minerals Ltd (Antipa), requested Strategic Metallurgy (SM) update processing inputs to support an update to Antipa's 2022 Minyari Dome Project Scoping Study. Strategic Metallurgy provided preliminary process design as, well as capital and operating cost assumptions, for the processing options examined in the 2022 study. This memo summarises:

- Preliminary metallurgical testwork results for GEO-01 ore samples
- Updates to capital and operating costs to support a revision to the 2022 scoping study
- Operating cost estimates for the GEO-01 material.

GEO-01 TESTWORK SUMMARY

In July, 2024, SM received 20 bags of RC chips from GEO-01. The bags were composited and tested for gravity gold recovery and cyanide leach recovery on the tailings from the gravity test. Composite head assays and test results are summarised in Table 1 below. Leach kinetic curves are shown in Figure 1.

Table 1: GEO-01 Composite Test Results

	Head Assays		Averaged	Head Assays
Composite	**Au (0)**	**Au (0) rpt**	**Au (g/t)**	**Ag (g/t)**
GEO-01	2.47	2.15	2.31	<2

Grind Size	Gravity Gold	Total Extraction	Lime addition (kg/t)	NaCN addtion (kg/t)	NaCN consumed (kg/t)	Calculated Head (g/t)
212µm	28.7%	85.9%	0.091	0.750	0.216	1.875
150µm	27.8%	86.5%	0.195	0.750	0.244	1.941
106µm	27.1%	89.8%	0.143	0.750	0.289	1.987
75µm	28.2%	89.5%	0.154	0.750	0.286	1.910

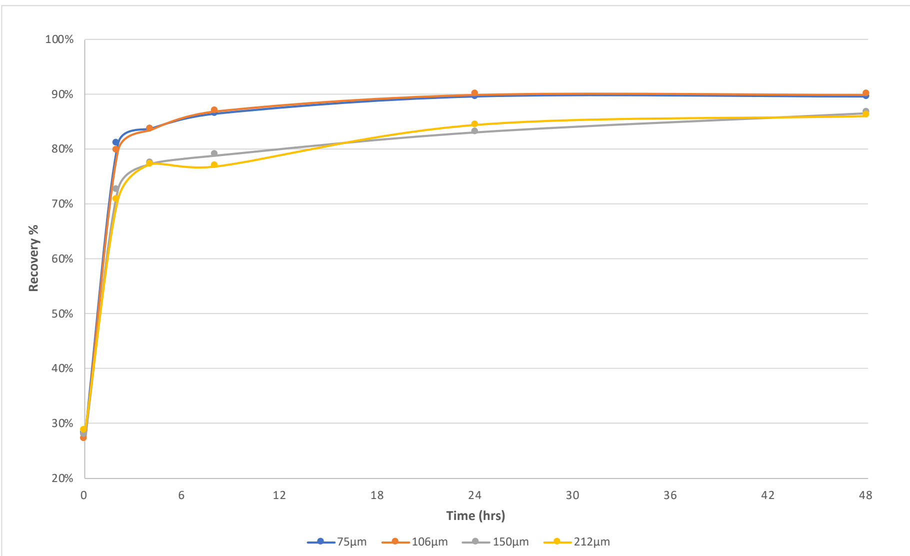


Figure 1: GEO-01 Cyanide Leach Kinetics

The results show that gold recovery is sensitive to grind size between to grind size between 106 and 150 micron 80% passing sizes.

Operating Cost Update

SM has revised the 2022 processing operating cost estimate as follows:

- Operating consumable costs were escalated by 11.9% by applying non-tradable price indices from the Australian Bureau of Statistics. Consumable quantities remain unchanged.
- Process labour costs were escalated by 7.7% by applying wage price indices from the Australian Bureau of Statistics. Labour requirements remain unchanged.
- Power pricing was adjusted by 4.95% due to diesel price increases. The diesel price used for the update was supplied by Antipa. Power usage for processing facilities remains unchanged.
- Laboratory costs were escalated 7.7% by applying wage price indices.
- Maintenance material costs were escalated 5.9% by applying trade cost price indices from the Australian Bureau of Statistics.

CIL operating costs have also been estimated for GEO-01 ore. CIL operating, costs by scale, are summarised in Table 2 for the 2022 study, the 2024 study update as well as separate date specific to GEO-01 ore.

Table 2: CIL Option Process Operating Cost Summary

OPERATING COST			
	1Mtpa	2Mtpa	3Mtpa
	AUD$/t	AUD$/t	AUD$/t
2022 Study Inputs			
Operating Consumables	$ 9.23	$ 7.72	$ 7.22
Process Labour	$ 10.77	$ 5.38	$ 3.59
Power	$ 8.14	$ 7.42	$ 7.21
Laboratory	$ 0.98	$ 0.49	$ 0.33
Maintenance Materials	$ 1.23	$ 1.20	$ 0.87
TOTAL PROCESSING COST	$ 30.35	$ 22.21	$ 19.21
2024 Study Update			
Operating Consumables	$ 10.32	$ 8.64	$ 8.08
Process Labour	$ 11.60	$ 5.80	$ 3.87
Power	$ 8.54	$ 7.79	$ 7.56
Laboratory	$ 1.06	$ 0.53	$ 0.35
Maintenance Materials	$ 1.31	$ 1.27	$ 0.92
TOTAL PROCESSING COST	$ 32.83	$ 24.02	$ 20.78
GEO-01 Opex Inputs			
Operating Consumables	$ 7.35	$ 5.67	$ 5.11
Process Labour	$ 11.60	$ 5.80	$ 3.87
Power	$ 8.54	$ 7.79	$ 7.56
Laboratory	$ 1.06	$ 0.53	$ 0.35
Maintenance Materials	$ 1.31	$ 1.27	$ 0.92
TOTAL PROCESSING COST	$ 29.86	$ 21.05	$ 17.81

Flotation operating costs, by scale, are summarised in Table 3 for the 2022 study and the 2024 study update.

Table 3: Flotation Option Operating Cost Summary

OPERATING COST (AUD)			
	AUD$/t	AUD$/t	AUD$/t
2022 Study Inputs			
Operating Consumables	$ 9.57	$ 7.94	$ 7.40
Process Labour	$ 13.22	$ 6.61	$ 4.41
Power	$ 11.42	$ 9.35	$ 8.97
Laboratory	$ 0.90	$ 0.45	$ 0.30
Maintenance Materials	$ 2.92	$ 2.09	$ 1.66
TOTAL PROCESSING COST	$ 38.03	$ 26.44	$ 22.74
2024 Study Update			
Operating Consumables	$ 10.71	$ 8.88	$ 8.28
Process Labour	$ 14.24	$ 7.12	$ 4.75
Power	$ 11.98	$ 9.82	$ 9.42
Laboratory	$ 0.97	$ 0.48	$ 0.32
Maintenance Materials	$ 3.09	$ 2.21	$ 1.76
TOTAL PROCESSING COST	$ 40.99	$ 28.51	$ 24.52

G&A expenses, as well as refining charges, have been escalated by 6.28% the cost price indices from the Australian Bureau of Statistics. These revised costs for G&A are summarised in Table 4. The revised costs for refining charges are summarised in Table 5.

Table 4: G&A Cost Updates

G&A Expensess		
Case	CIL AU$/t	Flotation AU$/t
1Mtpa	4.47	9.78
2Mtpa	2.23	4.89
3Mtpa	1.49	3.26

Table 5: Refining charge Updates

Refining Charges		
Commodity	Units	Value
Gold	US$ / oz	0.51
Silver	US$ / oz	0.68
Copper	US$ / lb	0.11
Cobalt	US$ / lb	0.2657

Capital Cost Update

No modification has been made to the process designs completed in 2022. SM has revised the 2022 capital cost estimate as follows:

- Direct costs, including plant infrastructure costs, were escalated by 9.10% using coal price indices from the Australian Bureau of Statistics. Escalation for the tailings dam construction, however, was applied at using an average of the wage price indices and coal indices.
- EPCM costs, including temporary site work costs, were escalated by 7.7% Costs by applying wage price indices from the Australian Bureau of Statistics.
- First fills and spares costs were escalated using non trade price indices.
- Contingency was applied at 10% of direct costs, per the 2022 scoping study.

Updated capital cost estimates are summarised for the CIL option in Table 6 and the flotation option in Table 7.

strategic METALLURGY

Table 6: CIL Option Processing Capital Estimate Update

DIRECT COSTS	COST (AUD)					
	1Mtpa		2Mtpa		3Mtpa	
CRUSHING	$	6,314,901	$	8,528,216	$	10,076,754
COARSE ORE STORAGE AND RECLAIM	$	4,352,090	$	5,877,458	$	6,944,676
GRINDING AND CLASSIFICATION	$	17,660,620	$	24,034,391	$	26,812,781
GRAVITY	$	1,654,715	$	2,251,906	$	2,512,228
CYANIDATION	$	7,310,038	$	13,524,900	$	15,088,386
GOLD RECOVERY	$	5,320,709	$	2,211,230	$	2,466,849
CARBON REGENERATION	$	1,496,342	$	621,864	$	693,752
TAILINGS	$	3,301,846	$	7,802,781	$	8,704,787
REAGENTS- MIXING AND DISTRIBUTION	$	6,900,356	$	8,280,427	$	9,936,512
SITE SERVICES	$	6,821,653	$	8,185,983	$	9,823,180
OXYGEN PLANT	$	1,034,379	$	2,068,758	$	3,103,137
SUBTOTAL	**$**	**62,167,648**	**$**	**83,387,912**	**$**	**96,163,043**
INDIRECT COSTS						
EPCM	$	10,743,415	$	12,747,766	$	14,522,990
PLANT INFRASTRUCTURE	$	12,001,000	$	24,002,000	$	36,003,000
OTHER INRASTRUCTURE (TSF)	$	16,601,700	$	16,601,700	$	16,601,700
INSURANCES	$	60,365	$	71,627	$	81,602
TEMPORARY WORKS	$	1,227,819	$	1,456,888	$	1,659,770
FIRST FILL AND REAGENTS	$	1,913,551	$	2,270,553	$	2,586,745
SPARES	$	1,275,700	$	1,513,702	$	1,724,497
CONTINGENCY	$	6,216,765	$	8,338,791	$	9,616,304
SUBTOTAL	**$**	**50,040,315**	**$**	**67,003,027**	**$**	**82,796,607**
TOTAL	**$**	**112,207,963**	**$**	**150,390,939**	**$**	**178,959,651**

Table 7: Flotation Option Processing Capital Estimate Update

DIRECT COSTS	COST (AUD)					
	1Mtpa		2Mtpa		3Mtpa	
CRUSHING	$	6,314,901	$	9,032,582	$	10,076,754
COARSE ORE STORAGE AND RECLAIM	$	4,352,090	$	6,225,056	$	6,944,676
GRINDING AND CLASSIFICATION	$	17,660,620	$	24,034,391	$	26,812,781
GRAVITY	$	1,654,715	$	2,251,906	$	2,512,228
FLOTATION	$	20,678,173	$	31,342,250	$	39,974,673
FINE GRIND AND CLASSIFICATION	$	4,619,478	$	7,001,820	$	8,930,292
TAILINGS	$	5,147,915	$	7,802,781	$	9,951,857
FLOTATION CONC THICKENER	$	1,031,993	$	1,564,209	$	1,995,031
CONC FILTER	$	11,019,816	$	16,702,918	$	21,303,310
REAGENTS- MIXING AND DISTRIBUTION	$	3,816,296	$	5,784,424	$	7,377,595
SITE SERVICES	$	5,099,537	$	7,729,453	$	9,858,334
SUBTOTAL	**$**	**81,395,535**	**$**	**119,471,789**	**$**	**145,737,533**
INDIRECT COSTS						
EPCM	$	14,067,176	$	20,647,976	$	25,187,895
PLANT INFRASTRUCTURE	$	12,001,000	$	24,002,000	$	36,003,000
OTHER INRASTRUCTURE (TSF)	$	16,601,700	$	16,601,700	$	16,601,700
INSURANCES	$	79,040	$	116,016	$	141,525
TEMPORARY WORKS	$	1,607,677	$	2,359,769	$	2,878,617
FIRST FILL AND REAGENTS	$	2,505,558	$	3,677,690	$	4,486,312
SPARES	$	1,670,372	$	2,451,793	$	2,990,875
CONTINGENCY	$	8,139,554	$	11,947,179	$	14,573,753
SUBTOTAL	**$**	**56,672,078**	**$**	**81,804,123**	**$**	**102,863,677**
TOTAL	**$**	**138,067,613**	**$**	**201,275,912**	**$**	**248,601,211**

Appendix 2

Process Design Report - July 2022

Antipa Minerals Ltd

Minyari Scoping Study

Process Design Report

July 2022

Confidentiality

The information contained in this report is confidential.

The report and its contents may not be copied or distributed.

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Author(s):	Nick Vines,
Date:	July 2022
Job Number:	J000310
Version / Status:	Rev 1
Path & File Name:	Macintosh HD:Users:Nick:Strategic Metallurgy Dropbox:Nick Vines:Jobs Current:Antipa:J000310 Scoping study 2022:Report:RP_AT Process Package Report_20220711_Draft.docx
Print Date:	Tuesday, 22 October 2024

Document Change Control

Version	Description (section(s) amended)	Author(s)	Date
Draft	Draft – Internal Review	Nick Vines	11/07/2022
Rev1	Addition of tailings design	Nick Vines	01/08/2022

Document Review and Sign Off

Prepared By	Authorised By
Jono Adams	Nick Vines

Contents

1 EXECUTIVE SUMMARY

Antipa Minerals Ltd (Antipa) engaged Strategic Metallurgy (SM) as metallurgical consultant to develop a process package for a processing facility to treat ore from the Minyari resource. The processing cost estimates were developed to a Scoping Study level (±35%). The documentation provided includes:

- Process description
- High level process flow diagram
- Major mechanical equipment list
- High level mass balance
- Capital and operating costs

Antipa requested two options to be assessed during the course of the study at 1Mtpa, 2Mtpa and 3Mtpa treatment rates, namely:

Case 1: Free milling gold recovery flowsheet.

Case 2: Base metal recovery flowsheet for separate copper-gold and cobalt concentrates.

The two cases present very different metallurgy with respect to products and recovery. This is reflected in the design with slight variations in equipment selection and flowsheet requirements, although the overall process design is very similar in both cases. The key design production data and cost estimates are summarised in the table below.

Production data	Units	Case 1			Case 2		
Throughput		1Mtpa	2Mtpa	3Mtpa	1Mtpa	2Mtpa	3Mtpa
Feed Grade	gpt Au		1.60			1.60	
	% Cu		0.19			0.19	
	% Co		0.03			0.03	
Recovery							
Gold	%		88.3			87.9	
Copper	%					81.0	
Cobalt	%					49.4	
Production rate							
Gold	ozpa	45,423	90,845	136,268	45,217	90,434	135,650
Copper	tpa				1,539	3,078	4,617
Cobalt	tpa				148	296	445
Capital cost*	AUD	$96M	$122M	$145M	$120M	$178M	$221M
Operating cost*	AUD/t	19.2	22.2	30.4	22.7	26.4	38.0

* *Process plant only*

The capital cost estimates are based on the high level process design for each design case with major equipment estimates provided from a combination of vender estimates and SM’s internal database. The capital cost estimates’ battery limit encompasses all process equipment from RoM bin to concentrate/ doré dispatch and tailings discharge pump and includes associated installation costs. The estimate includes an allowance for owners and EPCM costs. The capital cost estimates are in Australian dollars, exclusive of any contingency and with a base date of second quarter 2022.

The operating cost estimates are derived from testwork where available and the process design. The operating cost estimates include labour, maintenance, power, reagents and process plant consumables. Power and labour are the most significant operating costs.

2 METALLURGY

2.1 Testwork summary

There are two main ore types at Minyari and WACA – oxide and primary (fresh) with a portion of transitional overlap. The two main ore types have different behaviours, with testwork conducted on Minyari and WACA ore in May 2017 and February 2018 summarised below.

2.2 Gold testwork (May 2017)

The Minyari mineralogy is dominated by feldspar, quartz, pyroxene and minor sulfides such as pyrite, pyrrhotite and chalcopyrite. Gold generally occurs as well-liberated fine-grained electrum or native gold on sulfide boundaries and to a minor degree with silicate grains. The primary cobalt mineral identified is cobaltite and has a high association with gold.

Overall, the diagnostic test results indicate that the ore (oxide and primary) will respond well to typical free milling conditions. Cyanide consumption for oxide composites is on the higher end (>1kg/t) for a conventional free milling operation due to cyanide soluble copper.

Concentration of the gold by flotation was possible with a gold grade in excess of 150gpt achieved in some samples. Some primary samples illustrated concentration of base metals during flotation, in particular copper and cobalt. Copper and cobalt grades of up to 8% and 2% respectively were achieved in some intermediate concentrates. Separate copper recovery, although achievable, is unlikely to be economically justified due to the low grade of samples tested. Cobalt recovery will depend on the grade of concentrates required to be saleable and requires further investigation.

Although gold recovery by gravity/ flotation was acceptable for both oxide and primary samples, it was less than that which can be achieved through conventional free milling gold treatment processes.

There does not appear to be a substantial difference in performance between the Minyari and WACA samples.

Table 2-1: Diagnostic leach test work summary results

	Unit	OX 1.0	OX 2.0	OX 3.0	PR 1.2	PR 4.7	PR 2.7 (West)	PR 2.5 (WACA)
Assayed Head	g/t	1.20	2.16	2.85	1.21	3.39	1.83	2.40
Calculated Head	g/t	0.99	1.05	2.35	1.09	3.14	2.24	2.08
Cyanide Consumption	kg/t	1.19	1.90	1.96	0.52	0.89	0.63	0.63
Diagnostic Leach Results								
Gravity Gold	%	10%	9%	24%	27%	35%	54%	34%
CN Amenable	%	87%	83%	73%	59%	53%	36%	51%
Sulfide Locked	%	2%	6%	2%	13%	11%	9%	12%
Silicate Locked	%	1%	2%	1%	1%	0%	1%	3%

2.3 Flotation testwork (February 2018)

Testwork conducted during 2017 demonstrated the ability to treat Minyari/WACA material by conventional free milling techniques as well as the potential to concentrate base metals, in particular copper and cobalt, and gold by flotation. Copper and cobalt grades of up to 8% and 2% respectively were achieved during that phase of work. Based on the 2017 results, a sighter testwork program was conducted to identify:

- The viability of producing a saleable cobalt/copper concentrate via flotation
- The viability of producing a saleable cobalt concentrate through gravity concentration

The majority of the testwork program focussed on primary ore (composite PR3_1710) with a lesser volume of work conducted on oxide composite OX1_1710. Overall, the testwork program achieved both primary objectives. Separate copper and cobalt concentrates were generated by flotation despite a limited number of tests and cobalt demonstrated amenability to concentration by gravity. All tests were conducted in open circuit.

Key results include copper recovery to a copper rougher concentrate of up to 94% with gold recovery up to 82% from PR3_1710. Cleaning of the copper rougher concentrates to >14% Cu was achieved at acceptable stage recoveries and gold was concentrated to 40gpt. Intermediate concentrate grades were 21.9% and 67gpt for copper and gold respectively.

Cobalt recovery to a cobalt rougher concentrate ranged from 62% to 68% from PR3_1710. Cleaning of the cobalt rougher concentrates to >3.4% Co were achieved at acceptable stage recoveries and intermediate concentrate grades of up to 5.6% Co were achieved by flotation. Cobalt recovery was heavily influenced by grade variations between tests due to a low head grade, making direct correlations difficult.

Total recovery of gold to both copper and cobalt rougher concentrates was as high as 88.9%. No flotation testwork was conducted on the oxide ore.

Table 2-2: Flotation result summary

Test	Copper/gold concentrate				Cobalt concentrate	
	Cleaner Recovery (Rougher)		Grade		Cleaner Recovery (Rougher)	Grade
	Copper	Gold	Copper	Gold	Cobalt	Cobalt
FT 8	(87.3%)	(86%)	3.9%	11.7 g/t	(68.2%)	1.5%
FT 9	(93.4%)	N/A	7.0%	N/A	(11.6%)	0.2%
FT 10	92.6% (97.7%)	(88.4%)	6.3%	17.5 g/t	3.9% (90.1%)	0.3%
FT 11	88.4% (92.3%)	82.0 (84.2%)	11.7%	21.7 g/t	(47.2%)	1.2%
FT 12	85% (93.9%)	68.0 (77.0%)	14.4%	39.5 g/t	35.9% (40.9%)	2.7%
FT 13	83.4% (91.6%)	63.5 (81.7%)	12.7%	22 g/t	50.8% (61.8%)	3.4%

Gravity recovery of gold from PR3_1710 was high (71%). Interestingly, the recovery of copper was comparatively low (<10%), indicating that the copper and gold mineralogy are largely separate and distinct. Cobalt concentrated to the gravity concentrate with 66% recovery. This was upgraded further to 11% cobalt by tabling, albeit at a low stage recovery (61%).

Gravity recovery of gold from OX1_1710 was good (50%). Cobalt, although concentrated, had a low gravity recoverable component in the oxide ore (<15%). This observation in conjunction with a significantly different iron to arsenic ratio compared to the primary ore would indicate that the oxide cobalt mineral is different (not cobaltite) and most likely an oxidised form of the primary mineralisation.

Table 2-3: Gravity results

	Mass	Gold		Copper		Cobalt	
PR3_1710	%	g/t	%dist	%	%dist	%	%dist
Table Conc	0.23	238	32.4	4.97	3.22	10.8	40.5
OX1_1710							
Table Conc	0.08	432	18.5	4.21	0.84	6.54	4.1

Preliminary testwork indicates that the primary (fresh) ore is twice as hard as the oxide however this is only relative, and no comminution testwork has been undertaken to date.

2.4 Application of testwork to process design

2.4.1 Feed grade

Comparison of the resource grades from the defined ore types and testwork composites match well with respect to gold grade, however significant variance exists for copper and cobalt (0.19% vs. 0.38% for copper and 0.03% vs. 0.06% for cobalt). As the resource grades differ from the tested composites, there is potential also for the recovery to deviate from that determined by testwork.

For the purpose of this study, it has been assumed that the recovery for each ore type determined during the testwork program will be the recovery, irrespective of the resource ore type grade. This should be confirmed during future studies.

2.4.2 Design concentrate grade

The mass balance has been designed to target a copper/gold concentrate grade of >16% Cu and a gold grade >100gpt. This has been chosen based on readily saleable copper/ gold concentrate terms and confirmed through testwork results to date.

A target cobalt concentrate grade of >4% Co has been selected and is a combination of recovery by gravity and flotation techniques. Higher concentrate grades have been achieved (as demonstrated during testwork), however a higher recovery design point has been chosen. The lower cobalt grade may be conservative but is based on that readily achieved in testwork.

2.4.3 Design recovery – CIL flowsheet

The average cumulative gravity and cyanide recoverable gold from testwork has been used to provide the CIL flowsheet gold recovery for each ore type. No testwork has been completed from ore representing transitional material and has assumed the numerical average of both Oxide and Fresh.

Table 2-4: CIL gold recovery

	Minyari			Waca
	Oxide	**Transitional***	**Fresh**	**Fresh**
Gravity recoverable	14.2	27.0	38.8	34.1
Cyanide recoverable	81.0	-	49.5	51.1
Total gold recovery	95.2	92.0	88.3	85.2

**Assumed*

2.4.4 Design recovery – Flotation flowsheet

Current testwork has not accounted for nor tested the inclusion of intermediate concentrate streams within the flowsheet. It is anticipated that this is a vital component of the flowsheet and should be investigated during subsequent studies.

For completeness, the proposed scoping study flowsheet includes the likely recycle streams such as re-cleaner and cleaner tails. Accordingly, these streams have been included in the mass balance to enable equipment sizing. The copper and cobalt recovery have been determined by interpolating the testwork results at the selected concentrate grade to determine the open circuit recovery. The recovery from intermediate streams has been assumed and added to the open circuit recovery to determine the closed circuit recovery.

Table 2-5: Closed circuit copper and cobalt flotation recovery

	Oxide		Transitional		Fresh (Minyari)			
	Copper	Cobalt	Copper	Cobalt	Copper		Cobalt	
	%dist	%dist	%dist	%dist	%	%dist	%	%dist
Testwork concentrate	No Testwork				16.1	79.0	4.60	46.5
Intermediate stream					1.59	15.0	0.75	22.0
Recovery from intermediate						40%		20%
Closed circuit recovery	7.0	26.7	46.0	38.7		85%		50.8

No cleaner flotation work has been completed for WACA or oxide/ transitional resources and recovery estimates have been made.

No combined gravity and flotation work has been completed to date and the incorporation of both circuits is expected to improve overall gold recovery. As such, the gold recovery assumes that the rougher recovery achieved during testwork is the closed circuit gold recovery. This methodology builds in potential upside by combining a gravity and flotation flowsheet.

Table 2-6: Closed circuit gold gravity - flotation recovery

	Oxide	Transitional	Fresh
Gravity recovery	14.2	26.5	38.2
Flotation recovery (-gravity)	53.0	51.4	50.5
Closed circuit gold recovery	67.0	77.9	88.8

It is important to distinguish the design recovery from that of the global recovery estimate. The design recovery is for design purposes only whilst the global recovery estimate should be used for all economic analyses.

2.5 Global recovery estimate

The global recovery estimate is required to determine the design production rate, specific product grades for the life of mine and provides a basis to conduct economic analyses for the project.

The global recovery estimate assumes a constant recovery for each ore type and that the ore types are treated at the ratio specified in the resource for the life of mine. It should be noted that this is generally not the case, as mining schedules will have bearing on the ore delivery. However, in the absence of a mining plan and for the purpose of a scoping study, this is a sound assumption.

The global recovery estimate, presented in Table 2-7 Table 2-8, was determined using the life of mine average ore composition for the scoping study cases and recoveries from metallurgical testwork. The estimate is the weighted average of ore type recovery for the relative ore types.

Table 2-7: Scoping study global recovery estimate – Case 1

		Ore	Gold	
		Mt	Feed (gpt)	Dist. (%)
WACA	Oxide	0.32	0.79	95.2%
	Trans	0.59	0.9	90.2%
	Fresh	2.33	1.04	85.2%
	Fresh	1.63	1.69	85.2%
Minyari	Oxide	0.60	0.99	95.2%
	Trans	1.80	1.18	91.8%
	Fresh	15.2	1.18	88.3%
	Fresh	10.6	2.48	88.3%
Total		**33.1**	**1.60**	**88.3%**

Table 2-8: Scoping study global recovery estimate – Case 2

		Ore	Gold		Silver		Copper		Cobalt	
		Mt	Feed (gpt)	Dist. (%)	Feed (gpt)	Dist. (%)	Feed (%)	Dist. (%)	Feed (%)	Dist. (%)
WACA	Oxide	0.32	0.79	67.0	0.13	48.4	0.09	7.0%	0.02	26.7%
	Trans	0.59	0.9	77.9	0.14	71.8	0.10	46.0%	0.02	38.7%
	Fresh	2.33	1.04	88.8	0.19	95.3	0.12	85.0%	0.02	50.8%
	Fresh	1.63	1.69	88.8	0.17	95.3	0.11	85.0%	0.03	50.8%
Minyari	Oxide	0.60	0.99	67.0	0.21	48.4	0.18	7.0%	0.03	26.7%
	Trans	1.80	1.18	77.9	0.31	71.8	0.17	46.0%	0.04	38.7%
	Fresh	15.2	1.18	88.8	0.54	95.3	0.18	85.0%	0.04	50.8%
	Fresh	10.6	2.48	88.8	0.73	95.3	0.24	85.0%	0.03	50.8%
Total		**33.1**	**1.60**	**87.9**	**0.53**	**94.0**	**0.19**	**81.0%**	**0.03**	**49.4%**

3 PROCESS DESCRIPTION

The process description provided below describes the processes necessary to treat Minyari ore to produce either doré gold (Case 1) or separate saleable copper/gold and cobalt concentrates (Case 2). The description covers the major processes, including crushing, milling, leaching, gravity concentration, flotation, concentrate dewatering and tailings dewatering. This document should be read in conjunction with the summarised flow diagrams for both design cases.

The concentrator makes use of differential flotation to produce separate copper and cobalt concentrate products, first floating copper minerals followed by cobalt minerals. Both design cases will incorporate similar comminution processes. Where relevant, process variations between design cases have been described. A summarised flowsheet illustrating the major processes is provided in Figure 3-2.

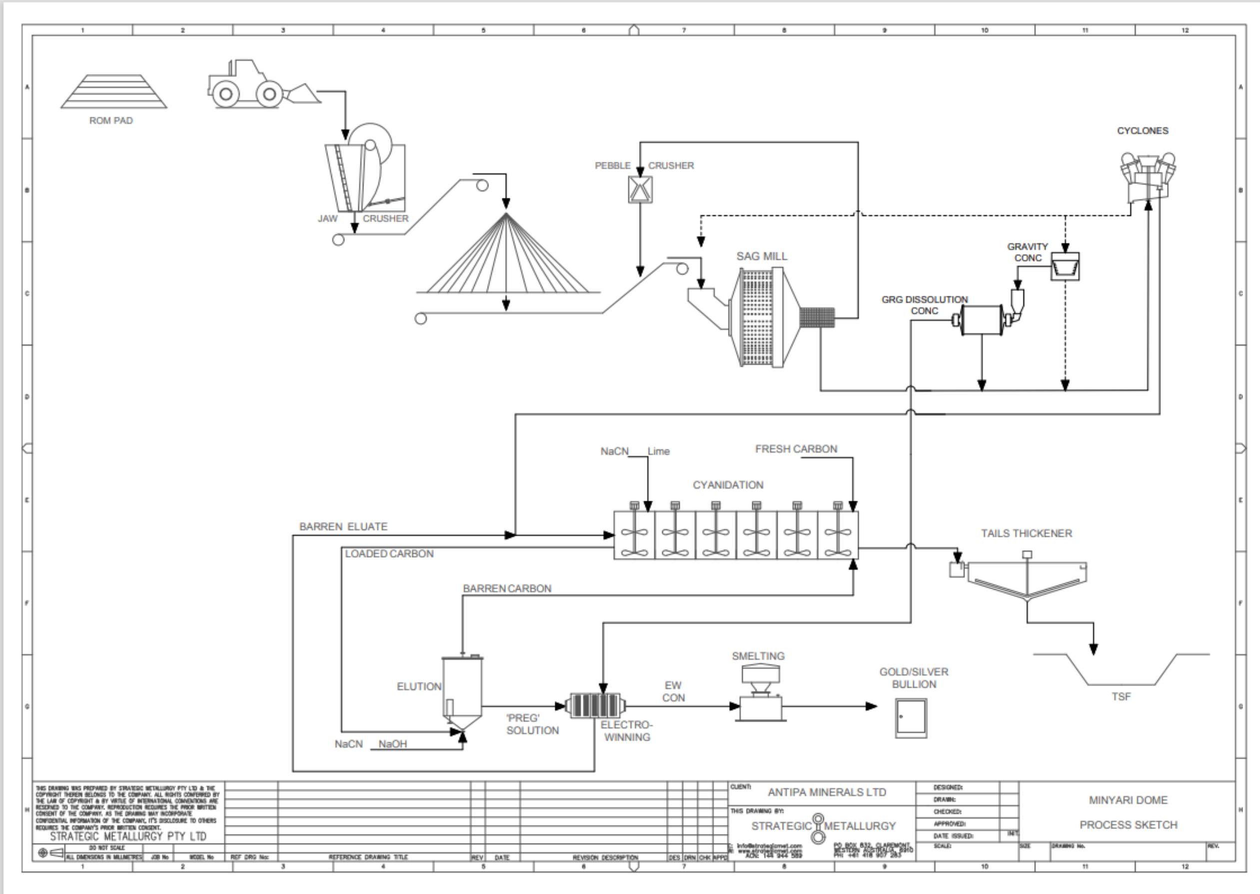

Figure 3-1: Block flow diagram of CIL flowsheet – Case 1

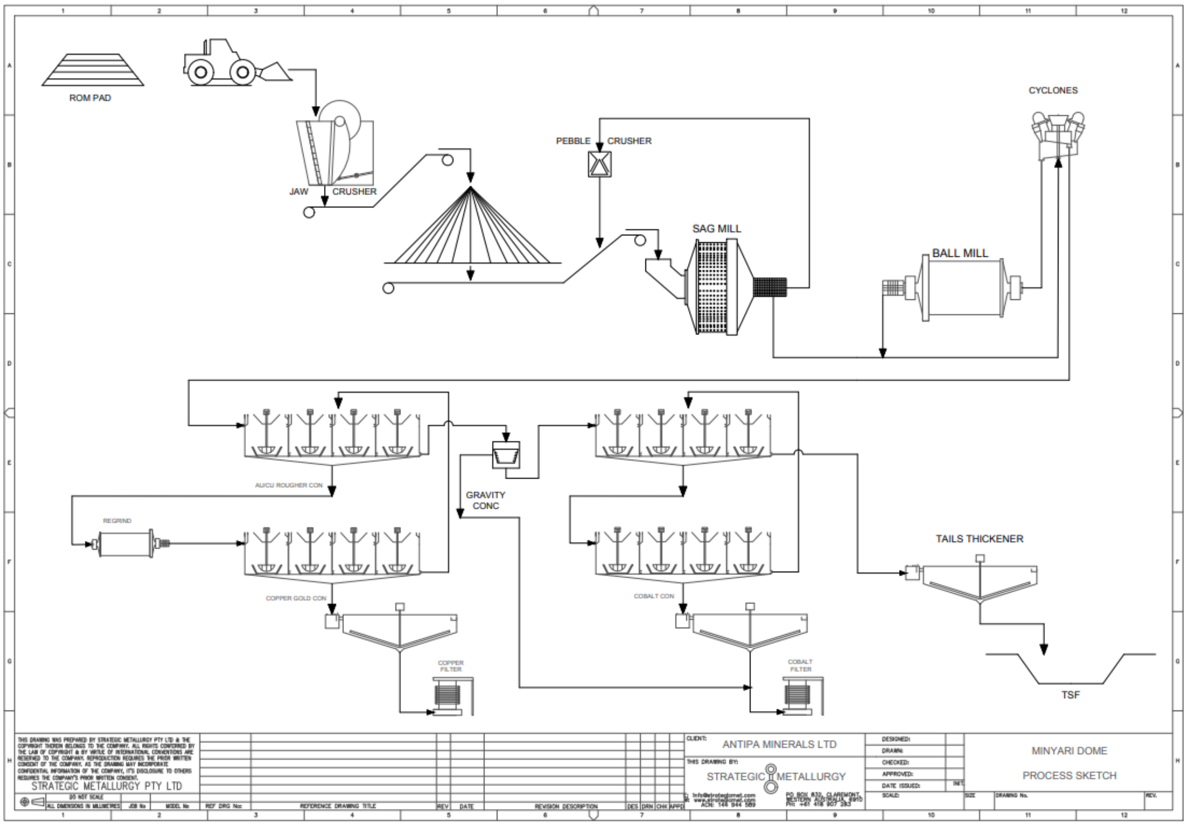

Figure 3-2: Block flow diagram of flotation concentrator – Case 2

3.1 Crushing

Feed ore will come from open pit mines at either the Minyari or WACA deposit or a combination of both. The mined ore will be trucked to the primary crusher station and dumped onto the RoM pad.

Ore from the Rom pad will be fed by bulldozer into the RoM bin above the primary crusher. A static grizzly screen above the RoM bin will control the top size of material fed to the primary (jaw) crusher. A rock breaker will reduce oversize material on the grizzly. An apron feeder withdraws ore from the RoM bin into the primary crusher. A self-cleaning tramp metal magnet above the crusher discharge conveyor removes tramp metal from the crusher discharge in order to prevent damage to downstream conveyors and potential chute blockages.

Crushed ore is transferred from the primary crusher to a coarse ore stockpile and provides a buffer between the crushing and milling circuits. Apron feeder(s) withdraw ore at a controlled rate from beneath the ore silo and discharges ore onto the SAG mill feed conveyor.

The apron feeder discharges ore onto the SAG mill feed conveyor. A SAG mill feed conveyor weightometer measures fresh SAG mill feed for control and metal accounting purposes. The SAG mill feed conveyor also receives the discharge from the pebble crusher. A weightometer, post pebble crusher discharge, measures total SAG mill feed.

The SAG mill feed conveyor discharges crushed ore into the SAG mill feed chute. Grinding media for the SAG mill is deposited directly onto the SAG mill feed conveyor.

3.2 Milling circuit

Crushed ore is milled in a SAG mill in closed circuit with a pebble crusher. The ball mill is operated in closed circuit with a cyclone cluster to produce feed suitable for cyanide leaching.

Water and lime slurry are added in a pre-determined ratio to the SAG mill. The SAG mill trommel discharges onto a vibrating screen deck to remove pebbles from the discharge slurry. The oversize fraction discharges onto the SAG mill discharge conveyor. The undersize slurry gravitates into a mill discharge sump from where it is pumped to the cyclone cluster.

A self-cleaning tramp metal magnet above the SAG mill discharge conveyor removes any scrap metal and grinding media from the oversize fraction in order to prevent damage to the pebble crusher. The SAG mill discharge conveyor transfers oversize pebbles onto the pebble crusher feed conveyor which discharges into the pebble crusher feed bin. The pebble crusher is fed at a controlled rate by a single vibrating feeder that withdraws pebbles from the pebble crusher feed bin. The pebble crusher feed bin provides buffer capacity to minimize effects of surges in pebble transfer from the SAG mill. The pebble crusher discharges directly onto the SAG mill feed conveyor.

In order to by-pass the pebble crusher, a two-way chute on the discharge end of the pebble crusher feed conveyor can divert pebbles directly to the SAG mill feed conveyor.

Slurry pumped from the mill discharge sump to the cyclone cluster is classified to produce an overflow stream at a target particle size and slurry density. The overflow gravitates to either CIL tanks or float feed surge tank. The underflow from the cyclone cluster gravitates to SAG mill for further grinding.

3.2.1 Case 2 – Variation

Case 2 caters for two-stage milling (SABC configuration) to provide a flotation feed, which minimises slimes. The ball mill discharges slurry into the common mill discharge sump, shared with the SAG mill where it is pumped to a common cyclone cluster. The ball mill is fitted with a trommel screen to remove mill scats to a storage bunker. In Case 2, the cyclone underflow gravitates to the ball mill feed chute for further grinding.

3.3 Gravity Recovery Circuit

3.3.1 Case 1

The primary aim of the gravity concentrator is to recover coarse gold early in the flowsheet and maximise recovery. A centrifugal gravity concentrator(s) is fed from the mill discharge hopper at a rate equivalent to the fresh mill feed. A scalping screen prior to the concentrator will protect the concentrator. Concentrate will be discharged periodically to a storage tank, which is part of the intensive leach reactor.

The gravity concentrates will be drained into the intensive leach reactor (a batch leach process) where the process will extract the gold from the concentrate into a pregnant liquor. The pregnant liquor will be pumped to an electrowinning storage tank for electrowinning in a dedicated electrowinning cell. The barren slurry will be returned via a barren return tank to trash screen using the barren solution pumps. The gold collected from the gravity circuit electrowinning cell will be smelted separately using the available calcine oven and smelting furnace. This will allow for separate accurate metallurgical accounting of the gravity circuit. The final gold product (produce doré bars) will be stored after weighing in a gold safe.

3.3.2 Case 2

The primary aim of the gravity circuit is to recover and concentrate cobalt minerals, with a secondary aim of scavenging gold not recovered during copper flotation. A batch centrifugal gravity concentrator is fed from the copper rougher flotation tail hopper. Concentrate will be discharged periodically to a storage tank, which is part of the second stage gravity concentrator. Tailings from the primary gravity concentrator gravitate to the cobalt flotation circuit.

Primary gravity concentrate is fed at a consistent rate to a (second) continuous gravity concentrator to generate a final gravity concentrate, which is directed to the cobalt concentrate thickener for dewatering. Secondary gravity tails reports back to the copper rougher flotation tail hopper.

3.4 Cyanide leaching – Case 1 only

The classified slurry from the cyclone overflow will be directed by gravity to a trash screen. Oversize material from the trash screens will discharge into a dedicated bunker for disposal. Trash screen underflow will be directed to either the first or the second carbon in leach (CIL) tanks and is passed through a sampler. The sampler produces a sample for metal accounting and control purposes.

The CIL circuit will comprise one leach tank and six adsorption tanks each with a nominal capacity depending on the throughput rate, providing a slurry residence time in the leach circuit of 30 hours with a slurry density of 40% solids by weight.

Each CIL tank will be fitted with mechanically wiped carbon inter-tank retention. Carbon will be held in all tanks except the first tank where the carbon retention screen will act as a safety screen to prevent oversize material entering the carbon tanks in the event of cyclone roping and a trash screen overflow or failure.

All tanks will be equipped with hollow shaft agitators to facilitate oxygen injection through the shafts should the oxygen demand from the ore dictate the need for oxygen addition. The first three tanks will also be fitted with a nozzle to facilitate oxygen injection through the side of the tanks.

Each CIL tank will be equipped with recessed impeller pumps. These will be used to advance the carbon, except in the case of CIL tank 1. The recessed impeller pump in tank 1 will be used to pump slurry over the carbon removal screen to enable carbon to be removed from the circuit.

A vibrating carbon recovery screen above CIL tank 1 will remove carbon from the circuit (from CIL tank 1) and drop it into a rubber lined carbon storage vessel/hopper. This vessel will be used to acid wash the carbon on those occasions that acid washing is required.

A tailing carbon safety vibrating screen below the outlet of CIL tanks 5 and 6 will be located off the side of the tanks adjacent to CIL tank 6. This screen will collect any carbon that escapes from CIL tank 6 (or tank 5 in the event that tank 6 is off-line) in a disposal drum for reintroduction to the circuit manually. The tailings from the tailings safety screen will be gravity fed to a tailings cyanide detox tank whereby copper catalysed (peroxide) cyanide destruction is performed to reduce cyanide to acceptable levels.

A five-tonne travelling gantry crane mounted above the tanks will facilitate removal of the screens for maintenance and cleaning. The crane will be arranged so that it can also be used for removing agitator gearboxes.

The tanks will be constructed on concrete ring beams within a concrete bunded containment structure with a sump pump. The sump pump adjacent to the stripping plant will collect any stripping plant spillage and direct it to tank 2.

3.5 Elution and goldroom – Case 1 only

The acid wash and rinse cycles will be performed as required in the rubber lined carbon storage vessel/hopper that will be located beneath the loaded carbon removal screen (Split AARL system). Following the rinse cycle, the carbon in the storage hopper will be dumped into the elution column though an actuated ball valve. The elution column will have a volumetric capacity capable of holding 2-6 tonnes of carbon.

The strip solution will be injected with sodium hydroxide and sodium cyanide and then be preheated by the in-line strip solution heater to reach a solution temperature of 130°C. The hot strip solution will then be introduced to the bottom of the elution column.

After approximately one "bed-volume" of caustic cyanide solution has been passed through the elution column to pre-soak the carbon, a further five bed volumes of hot rinse water will be passed through the column. A further one bed volume of cold rinse water will be passed through the column after the hot rinse water to cool down the carbon. The pre-soak and rinse water will be delivered via two eluate filters to either one of the two pregnant solution tanks via a recovery heat exchanger to return heat to the strip solution from the eluate.

Elution of the gold from the carbon is expected to take about 8 hours and pregnant liquor will be collected into either one of two pregnant liquor tanks. The pregnant liquor tanks will have a pregnant liquor pump which will feed the dedicated electrowinning cells and return barren solution from the electrowinning to the CIL tanks.

Steel wool cathodes from electrowinning cells will be oxidised in a calcine oven. The product from the calcine oven will be direct smelted using fluxes in an LPG fluid barring furnace to produce doré bars which after weighing will be stored in a gold safe.

Barren carbon will be pumped from the elution column to the regeneration kiln storage hopper above CIL tank 6 at the completion of the elution cycle. From this hopper the carbon is either regenerated in a kiln or dropped directly into tank 6 by gravity. The barren carbon will be de-watered over a small sieve bend screen above the storage hopper. The rotary kiln feed chute will drain any residual and interstitial water from the carbon prior to it entering the kiln. Kiln off-gases will also be used to dry the carbon before it enters the kiln. The regeneration kiln will sit on top of CIL tank 6 below the storage hopper. Regenerated carbon will drop back into CIL tank 6.

3.6 Flotation general – Case 2 only

Overflow from the ball mill cyclone is transferred to the flotation circuit to produce separate copper and cobalt concentrates via differential flotation. The flotation circuit is split into two parts, selective copper flotation followed by cobalt flotation to produce copper and cobalt concentrates respectively. Copper not recovered during selective flotation is generally recovered in the subsequent cobalt flotation circuit and reports to the cobalt concentrate. The two flotation circuits are separated by gravity concentration.

3.6.1 Copper flotation

Copper sulfide minerals are selectively recovered in the copper circuit through the use of a copper sulfide selective collector in combination with iron sulfide depressants. The majority of other sulfide and gangue minerals remain in the copper rougher tailings, which are directed to the gravity concentration and subsequent cobalt flotation circuits.

Overflow from the ball mill cyclone cluster gravitates to the float feed surge tank. The cyclone overflow stream is screened prior to the float feed surge tank to remove any oversize material and is passed through a sampler. The sampler produces a sample for metal accounting and control purposes.

The slurry in the float feed surge tank is mixed with depressant at a pre-determined ratio. The float feed surge tank provides sufficient time for conditioning with the fresh slurry. The surge tank provides buffer capacity to minimise any effect that variations in flow-rate and density of cyclone overflow has on flotation performance.

The conditioning tank is pumped into the copper roughers, a row of mechanical flotation cells in series. Frother is added to the first copper rougher to provide froth stability. The bulk of the copper sulfide minerals and gold in the feed are recovered into the concentrate. The concentrate collects in a common launder and flows by gravity to the copper regrind cyclone feed sump.

Copper rougher concentrate is pumped to the copper regrind cyclone cluster for dewatering prior to regrinding. The cyclone underflow gravitates to the regrind mill feed sump. The slurry is then pump fed to the regrind mill, an IsaMill style regrind mill, for further grinding and liberation of copper sulfide and gold minerals. Discharge from the regrind mill combines with overflow from the cyclone cluster in the regrind mill discharge sump. Slurry from the regrind mill discharge sump is pumped to the head of the copper cleaners.

The copper cleaners, a row of mechanical flotation cells in series recover a majority of the copper minerals into the concentrate, which collects in a common launder and flows by gravity to the copper cleaner concentrate sump from where it is pumped to the copper/gold concentrate thickener. Tailings from the copper cleaners gravitate to the copper cleaner-scavengers. The copper cleaner and cleaner scavenger cells are effectively arranged as a single bank of cells in series, including intermediate conditioning tanks. Additional depressant and collector can be to selectively depress iron sulfide minerals. A portion of the copper minerals in the copper cleaner tailings is recovered into the copper cleaner-scavenger concentrate. Concentrate collects in a common launder and flows by gravity to the copper cleaner-scavenger sump from where it is pumped to the copper/gold concentrate thickener. Tailings from the copper cleaner-scavenger gravitates to the copper cleaner-scavenger tailings sump where it is pumped to the copper rougher circuit.

The copper cleaner concentrate can be diverted to a re-cleaner stage for further upgrading to meet target concentrate grade. The re-cleaners can still be bypassed in the event that the cleaner concentrate grade meets specifications.

3.6.2 Cobalt flotation

Cobalt sulfide minerals are selectively recovered in the cobalt flotation circuit, along with any remaining copper minerals. Gravity circuit tails gravitates to the agitated conditioning tank ahead of the cobalt roughers. Collector, activator and sulfuric acid are added to the feed and conditioned prior to flotation in a row of mechanical flotation cells in series. The concentrate collects in a common launder and flows by gravity to the cobalt rougher concentrate sump.

Tailings from the cobalt roughers flows by gravity to the cobalt rougher tailings sump and is pumped to the final tailings thickener.

Concentrate from the cobalt rougher is pumped to a conditioning tank ahead of the cobalt cleaners. Depressants are added to selectively depress the flotation of iron sulfide gangue minerals. The majority of cobalt and copper sulfide minerals in the feed to the cleaners are recovered to concentrate.

Concentrate collects in a common launder and flows by gravity to the cobalt cleaner concentrate sump from where it is pumped directly to the cobalt concentrate thickener. Tailings gravitate to the cobalt cleaner tails sump from where it is pumped to the final tailings thickener.

The cobalt cleaner concentrate can be pumped either to the cobalt concentrate thickener or the cobalt re-cleaner circuit for further upgrading if required.

3.7 Dewatering and storage – General

Copper and cobalt concentrates are dewatered in separate circuits, each making use of a high rate thickener followed by a pressure filter to produce a wet filter cake for storage. Separate storage areas for the cobalt and copper products are required to minimise potential for inadvertent contamination. Tailings is dewatered in a high-rate thickener prior to disposal in a dedicated storage facility.

3.7.1 Copper/gold concentrate dewatering

Copper/gold concentrate from the copper flotation circuit gravitates to a high-rate thickener. The concentrate first passes via a trash screen and a sampler prior to the thickener. The sampler produces a sample for metal accounting and control purposes. Dilute flocculant solution is pumped to the thickener to assist with the settling of fine copper mineral particles and to improve clarity of the thickener overflow.

Copper/gold concentrate thickener underflow slurry gravitates to an underflow sump and is pumped to the copper filter feed surge tank. Thickener overflow gravity flows to an overflow tank and is pumped to the copper process water tank.

The copper filter feed surge tank provides buffer capacity between the copper concentrate filter and the copper flotation circuit. Copper/gold concentrate is fed batch-wise to the copper filter from the filter feed surge tank. The copper/gold concentrate filter is a single dedicated pressure filter capable of producing copper dried filter cake for storage. If required, clean water purified by the reverse osmosis unit can be used in a cake wash sequence during the filter cycle to reduce chloride content in the copper filter cake.

The copper/gold concentrate filter discharges filter cake into a bay whereby it is transferred to a dedicated storage area by front-end loader. The filtrate from the filter collects in a filtrate tank and is pumped back to the copper/gold concentrate thickener to recover process water.

3.7.2 Cobalt concentrate dewatering

Cobalt concentrate from the cobalt flotation and gravity circuit gravitates to a high-rate cobalt concentrate thickener. The thickener feed first passes via a trash screen and a sampler prior to the thickener. The sampler produces a sample for metal accounting and control purposes. Dilute flocculant solution is pumped to the thickener to assist with the settling of fine mineral particles and to improve clarity of the thickener overflow.

Cobalt concentrate thickener underflow slurry gravitates to an underflow sump and is pumped to the cobalt filter feed surge tank. Thickener overflow flows by gravity to an overflow tank and is pumped to the cobalt process water tank.

The cobalt filter feed surge tank provides buffer capacity between the cobalt concentrate filter and the cobalt flotation circuit. Cobalt concentrate is fed batch-wise to the cobalt filter from the filter feed surge tank. The cobalt concentrate filter is a single dedicated pressure filter capable of producing dried cobalt filter cake for storage. If required, clean water purified by the reverse osmosis unit can be used in a cake wash sequence during the filter cycle to reduce chloride content in the cobalt filter cake.

The cobalt concentrate filter discharges filter cake into a bay whereby it is transferred to a dedicated storage area by front-end loader. The filtrate from the filter collects in a filtrate tank and is pumped back to the cobalt concentrate thickener to recover process water and any solids lost due to cloth breakages.

3.7.3 Tailings dewatering

Tailings from the cobalt rougher are pumped to the final tailings thickener to recover process water. Both streams are sampled prior to discharging into the thickener feedbox. The sampler takes a sample for metal accounting and control purposes. Dilute flocculant solution is dosed to the thickener feed box to aid settling of the fine solids and improve clarity of thickener overflow.

Overflow from the thickener gravitates to the cobalt process water tank for re-use in the cobalt flotation circuit. Underflow from the thickener collects in the final tailings thickener underflow sump from where it is pumped to the tailings storage facility.

3.8 Reagents

A facility for mixing, storage and distribution of reagents at the rates listed in Table 3-1 is provided for both design cases.

Table 3-1: Summary of overall reagent consumptions

Reagent consumption	Units	Case 1	Case 2
PAX	gpt		200
Copper sulfate	gpt		100
Copper promoter	gpt		20
Chelating agent	gpt		100
Sodium sulfite	gpt		400
Sodium silicate	gpt		200
Frother	gpt		50
Sulfuric acid	kg/t		12.0
Lime	kg/t	1.20	
Cyanide	kg/t	1.07	
Oxygen	kg/t	0.50	
Activated carbon	gpt	26	
Caustic	kg/t	0.22	
Hydrochloric	kg/t	0.13	
Peroxide	kg/t	1.31	
Flocculant	gpt	100	

3.8.1 Cyanide

Cyanide will be delivered as a 30% solution and stored in a cyanide storage tank. Two cyanide circulating pumps, one operating and one standby, will circulate cyanide solution through the plant ring main with a constant pressure bypass return to the tank. A cyanide dosing pump will deliver cyanide from the ring main to the stripping plant in a controlled manner.

The cyanide mixing and storage tanks will be contained within a concrete bund with a collection sump to recover spillage. The sump pump will recover minor spillage and deliver it to the trash screen underflow distribution box.

Emergency supplies of cyanide will be held on site in containerised 1 tonne bulk bags. A bag splitter on the top of the mixing end of the dissolving tank will allow bulk bags of cyanide to be added in the event of transport interruption to the site.

3.8.2 Caustic Soda

Caustic soda will be delivered in liquid form in road tankers and stored in a caustic storage tank located in the same bunded containment as the cyanide dissolving and cyanide storage tanks. A dosing pump will draw the reagent from the caustic storage tank and deliver it to the stripping plant.

3.8.3 Hydrochloric Acid

Concentrated hydrochloric acid will be delivered in liquid form in road tankers and unloaded into a poly tank located in a concrete containment structure adjacent to, but separated from, the stripping plant. A concentrated acid pump will transfer concentrated hydrochloric acid from an acid storage tank to be proportionally combined with water from the water dilution pump to add 3% w/w HCl to the acid wash hopper for the carbon acid wash cycle.

The concrete containment bund surrounding both tanks will comply with the dangerous goods statutory requirements.

3.8.4 Activated Carbon

Activated carbon will be delivered in 600kg bulk bags, which will be transported to the site by road in containers. It will be stored in containers or under tarpaulins to protect it from the weather. When required, bags will be hoisted up to the top of CIL tank 6 and broken directly into the tank.

3.8.5 Oxygen

Oxygen gas will be manufactured on site using a pressure swing adsorption (PSA) plant purchased from a supplier. The option for liquid oxygen storage as back-up for the PSA system is feasible but has not been included. The utilisation of a well-maintained PSA plant exceeds the overall process plant utilisation for the project.

3.8.6 PAX

PAX (potassium amyl xanthate) is used as a non-selective sulfide mineral collector in the cobalt flotation circuit. PAX is delivered to site in 1000 kg bulka bags as a dry powder. PAX bags are transferred to a mixing tank via a hopper/bag splitter. The mixed solution is transferred into a storage tank, from which the PAX solution is dosed into the cobalt flotation circuit on a ring main that circulates PAX to the storage tank.

3.8.7 Sulfuric acid

Concentrated sulfuric acid is used to decrease the pH for cobalt sulfide flotation in the cobalt flotation circuit. Sulfuric acid is delivered to site in isotainers and stored in a dedicated storage tank. The acid is dosed into the cobalt flotation circuit on a low-pressure ring main that recirculates unused acid to the storage tank.

3.8.8 Copper promoter

A dialkyl dithiophosphinate collector is used as a selective collector for copper sulfide flotation in the copper flotation circuit. The promoter is delivered to site in intermediate bulk containers (IBC). The solution is dosed from a pump manifold connected directly to the IBC.

3.8.9 Triethylene tetramine

TETA is used as a chelating agent to aid in sulfide depression. TETA is delivered to site in intermediate bulk containers (IBC). The solution is dosed from a pump manifold connected directly to the IBC.

3.8.10 Sodium sulfite

Sodium sulfite is used in conjunction with TETA as a sulfide depressant. Sodium sulfite is delivered to site in 1000 kg bulka bags as a dry powder. Sodium sulfite bags are transferred to a mixing tank via a hopper/bag splitter. The mixed solution is transferred into a storage tank, from which the sodium sulfite solution is dosed into the copper and cobalt flotation circuits on a ring main that recirculates unused sodium sulfite to the storage tank.

3.8.11 Flocculant

Flocculant is used to aid the settling of solids particles in the copper and cobalt concentrate thickeners and the final tailings thickener. Flocculant will be delivered to site in 1000kg bulka bags as a dry powder. Flocculant bags are transferred to a vendor supplied mixing system where an activated solution of flocculant is prepared. Flocculant solution will be transferred from the vendor-supplied unit to the flocculant storage tank. A dedicated transfer pump will pump flocculant to each dosage point.

3.8.12 Lime

Slaked lime is used for pH control and to promote selectivity in the flotation circuit and maintain pH high enough to keep cyanide in solution. Slaked lime is dosed directly into the SAG mill and into the copper flotation circuit. Quicklime is delivered in bulk tankers and pneumatically conveyed directly to a storage silo. The lime is transferred from the silo at a controlled rate by a rotary valve and fed into the slaker mill via a screw feeder. The slaker hydrates the quicklime with raw water. The mill operates in open circuit, discharging into the slaker mill discharge sump and is pumped to the agitated lime storage tank for distribution. Slaked lime slurry is pumped into a ring main, circulating lime back to the storage tank, from which lime dosage lines are drawn in the flotation circuit.

3.8.13 Frother

Frother (MIBC) is used in the copper and cobalt flotation circuits to promote concentrate froth stability and to ensure adequate drainage of unwanted gangue minerals from the froth.

Frother is delivered to site in intermediate bulk containers (IBC). The contents of the IBCs are emptied into a storage tank. Frother is dosed into the cobalt flotation circuit on a ring main that recirculate unused frother to the storage tank.

3.8.14 Sodium silicate

Sodium silicate is used as a dispersant in the copper and cobalt circuit to minimise entrainment of non-sulfide gangue to concentrate. Sodium silicate is delivered to site in 1000kg bulka bags as a dry powder. Sodium silicate bags are transferred to a vendor supplied mixing system. Mixed sodium silicate solution will be transferred from the vendor-supplied unit to the sodium silicate storage tank and pumped to the flotation circuit for use.

3.9 Utilities

Key design criteria for the common utilities for both design cases are presented in **Error! Reference source not found.**. Utilities include:

- Compressed air
- Raw water
- Reverse osmosis water (for concentrate washing)
- Process water

3.9.1 Compressed air

Provision has been made for both low- and high-pressure air systems.

High pressure compressed air is supplied to the plant suitable for both instrument and filter air requirements. Compressors are sized based on comparative projects on a one operating/ one stand-by basis. A common discharge line will be equipped with a filter and dryer system ahead of an air receiver.

The low-pressure air blowers supply the air for the flotation circuit and have been sized based on cell requirements. There are two blowers, one duty/ one standby, supplying air into a common header feeding the flotation circuit.

3.9.2 Raw water

Raw water is supplied to the raw water tank from bore fields. Raw water is used for reagent preparation, gland seal water, process water make-up, fire service water and feed to the R/O unit. Raw water is pumped from the raw water storage tank into a common header from which streams are withdrawn. A minimum operating level can be maintained to ensure that fire water is always available.

3.9.3 *Reverse osmosis water*

Water purified by reverse osmosis (R/O water) is used in cobalt and copper concentrate filters to reduce the chloride content in final product filter cakes.

Raw water is pumped to the vendor supplied R/O plant to produce a permeate stream (R/O water) for use in the plant. The concentrated brine solution discharged from the R/O unit is pumped to final tailings for disposal.

3.9.4 *Gland service water*

Good quality water, free of excess solids, is required for pump gland service water (GSW) throughout the plant. Raw water is passed through a sand filter system prior to the GSW storage tank to remove any excess fine solid material that may cause damage to pump gland sealing systems.

GSW is pumped from the GSW storage tank into a header system for distribution throughout the plant. The GSW water requirement has not been sized.

3.9.5 *Process water*

Process water is used primarily as dilution water in the milling and flotation circuits. Two separate process water systems; namely the copper process water and the cobalt process water circuit, are provided.

Raw water is used as make-up for the copper process water circuit. Copper process water is used only in the milling and copper flotation circuit. Copper process water is pumped from the copper process water storage tank into a common header for distribution to the milling circuit and the copper flotation circuit.

Cobalt process water is supplied by the final tailings thickener overflow and cobalt concentrate thickener overflow, both of which collect in the cobalt process water storage tank. Cobalt process water is used only in the cobalt flotation circuit. Cobalt process water is pumped from the cobalt process water storage tank into a common header for distribution in the cobalt flotation circuit.

4 PROCESS DESIGN

4.1 Operating schedule

The plant will be a continuous 24hour per day operation, using two 12hour shifts per day, 365 days per year. The comminution and beneficiation plant equipment will be designed for 91.3% utilisation, equivalent to an operating time of 8,000h per annum. The crushing and filtration circuits will be designed to operate at 75% equipment utilisation.

Table 4-1: Scoping study operating schedule

Schedule		
Available hours	h/year	8760
Overall availability	%	91.3
Operating hours	h/year	8,000
Crushing - Filtration		
Availability	%	75
Availability	h/year	6,570
Mill - Flotation		
Availability	%	91.3
Availability	h/year	8,000

4.2 Design specifications

The scoping study has been conducted under three treatment rate scenarios. The key design data is provided in Table 4-2. Given the significant variation between the study cases, a substantial difference in the process flows and equipment are necessary as well as variances in the choice of process flowsheet. These are discussed in more detail in Section 3.

A mass balance for each case was constructed based on the selected flowsheet, industry standards and the results of testwork where available. The mass balance was extended to incorporate each of the throughput scenarios (1Mtpa, 2Mtpa and 3Mtpa).

The mass balance under design conditions indicates that Case 1 produces approximately 45,000ozpa, 90,000ozpa and 136,000ozpa for each scenario respectively. The Case 2 plant will produce approximately 10,000tpa, 20,000tpa or 30,000tpa of copper/gold concentrate in each scenario respectively and 3,700tpa, 7,400tpa or 11,100tpa of cobalt concentrate.

Table 4-2: Summary of key design data

Description		Case 1			Case2		
	Units	1Mtpa	2Mtpa	3Mtpa	1Mtpa	2Mtpa	3Mtpa
Feed							
Rate	dtph	125	250	375	125	250	375
Gold	gpt		1.60			1.60	
Copper	%		0.19			0.19	
Cobalt	%		0.03			0.03	
Doré							
Gold grade	%		90.0				
Gold recovery	%		88.3				
Production	ozpa	45,402	90,805	136,207			
Copper/ gold concentrate							
Gold grade	gpt					135	
Copper grade	%					16.0	
Gold recovery	%					80.9	
Copper recovery	%					81.0	
Production	dtpa				9,620	19,241	28,861
Moisture	%					8.0	
Cobalt concentrate							
Gold grade	gpt					30.4	
Cobalt grade	%					4.0	
Gold recovery	%					7.0	
Cobalt recovery	%					49.4	
Production	dtpa				3,704	7,408	11,112
Moisture	%					8.0	

4.3 Plant layout

No layout has been provided at this preliminary phase of the study. Refinements of the layout including area, operability, constructability and maintainability are required during the next phase of engineering.

4.4 Major mechanical equipment

The mechanical equipment list for each case has been selected based on the flowsheet and sized according to mass balance requirements for each scenario. In some cases, the capacity range of equipment selected covers multiple scenarios, (for example Jaw crusher size). The major mechanical equipment for each scenario is provided in Table 4-3 and Table 4-4.

Table 4-3: Case 1 – Major mechanical equipment

Item	Qty	1Mtpa	2Mtpa	3Mtpa
Primary jaw crusher	1	1220 x 760 mm, 150 kW motor, CSS 120-100 mm	2046 x 1254 mm, 225 kW motor, CSS 120-100 mm	2046 x 1254 mm, 225 kW motor, CSS 120-100 mm
Pebble cone crusher	1	90 kW, CSS 19 mm	90 kW, CSS 19 mm	90 kW, CSS 19 mm
Primary SAG mill	1	2000 kW, 3.0 m x 6.0 m	4000 kW, 3.5 m x 7.5 m	6000 kW, 4.0 m x 8.3 m mill
Primary screen	1	55 kW Single-deck, 1.8 m x 6.1 m, 30 mm apertures	75 kW Single-deck, 2.4 m x 6.1 m, 30 mm apertures	75 kW Single-deck, 2.8 m x 6.1 m, 30 mm apertures
Primary cyclone cluster	1	8 x cluster 4 operating 2 spare 400mmCVX	8 x cluster 4 operating 2 spare 500mmCVX	8 x cluster 4 operating 2 spare 650mmCVX
Gravity - Centrifugal concentrator	1	QS30 Knelson Batch	QS40 Knelson Batch	QS48 Knelson Batch
Gravity Intensive leach reactor	1	Gekko ILR 150BA	Gekko ILR 2000BA	Gekko ILR 4000BA
Cyanide leach (CIL) tanks	7	7 x 1000m3 tanks with 45 kW agitator, intertank screen and carbon advance pumps	7 x 2000m3 tanks with 90 kW agitator, intertank screen and carbon advance pumps	7 x 3000m3 tanks with 130 kW agitator, intertank screen and carbon advance pumps
Elution - AARL Acid wash and elution column with heaters	1	2 t batch type circuit, with one acid and one elution column and two electrowinning cells	4 t batch type circuit, with one acid and one elution column and two electrowinning cells	6 t batch type circuit, with one acid and one elution column and two electrowinning cells
Carbon regeneration kiln	1	2 t/day propane regeneration kiln	4 t/day propane regeneration kiln	6 t/day propane regeneration kiln
Detox tank	1	545 m3 live volume with 11 kW agitator	1100 m3 live volume with 22 kW agitator	2000 m3 live volume with 33 kW agitator
Tailings thickener	1	13 m diameter high rate	18 m diameter high rate	22 m diameter high rate

Table 4-4: Case 2 – Major mechanical equipment

Item	Qty	1Mtpa	2Mtpa	3Mtpa
Primary jaw crusher	1	1220 x 760 mm, 150 kW motor, CSS 120-100 mm	2046 x 1254 mm, 225 kW motor, CSS 120-100 mm	2046 x 1254 mm, 225 kW motor, CSS 120-100 mm
Pebble cone crusher	1	90 kW, CSS 19 mm	90 kW, CSS 19 mm	90 kW, CSS 19 mm
Primary SAG mill	1	800 kW, 2.2 m x 4.7 m	1600 kW, 2.7 m x 5.8 m	2400 kW, 3.0 m x 6.5 m
Primary Ball mill	1	1200 kW, 7.0 m x 3.9 m	2400 kW, 10.0 m x 4.5 m	3600 kW, 11.0 m x 5.0 m
Primary screen	1	55 kW Single-deck, 1.8 m x 6.1 m, 30 mm apertures	75 kW Single-deck, 2.4 m x 6.1 m, 30 mm apertures	75 kW Single-deck, 2.4 m x 6.1 m, 30 mm apertures
Primary cyclone cluster	1	8 x cluster 4 operating 2 spare 400mmCVX	8 x cluster 4 operating 2 spare 500mmCVX	8 x cluster 4 operating 2 spare 650mmCVX
Primary gravity separation – Centrifugal concentrator	1	QS30 Knelson Batch	QS40 Knelson Batch	QS48, Knelson Batch
Secondary gravity separation – Centrifugal concentrator	1	C2000 continuous falcon	C4000 continuous falcon	C4000 continuous falcon x2
Rougher flotation cells	10	30m^3 tank cells	60m^3 tank cells	90m^3 tank cells
Cleaner flotation cells	8	4m^3 conventional cells	8m^3 conventional cells	12m^3 conventional cells
Recleaner flotation cells	3	1m^3 conventional cells	1.5m^3 conventional cells	3m^3 cells
Air Blower	2	350 kW blowers	450 kW blowers	650 kW blowers
Regrind mill	1	263 kW, IsaMill M1000	525 kW, IsaMill M1000	788 kW, IsaMill M3000
Concentrate Thickener	2	7m diameter high rate	7m diameter high rate	7m diameter high rate
Tailings thickener	1	13m diameter high rate	18m diameter high rate	22m diameter high rate

4.5 Tailings storage facility

A tailings storage facility (TSF) is required to provide life of mine (LoM) storage for tailings from the Minyari process plant. The TSF will be constructed in staged compartments during the LoM using earth fill embankments. Tailings will be deposited along the perimeter using a beach drainage system to a central decant water collection facility.

Located 35km north of Telfer in the Paterson Province of Western Australia, the average climate data has been sourced from the Bureau of Meteorology (BoM) Telfer weather station data. Daily mean evaporation pan data has been selected from Port Hedland.

Table 4-5: Weather data – Telfer (Source BoM)

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean max temperature (°C)	40.3	38.7	37.7	34.8	29.3	25.6	25.9	28.7	33.3	37.8	39.7	40.4	34.4
Mean min temperature (°C)	26.3	25.8	24.5	21	15.5	12	10.9	12.5	16.9	21.8	24	26	19.8
Mean rainfall (mm)	74.1	103.9	81.9	19.2	17.8	14.3	11	4.7	1.3	3.3	12.4	58.1	402
Highest rainfall (mm)	382	344	466	115	104	101	86	48	21	29	71	296	817
Mean daily evaporation(mm)	10.4	9.6	9.3	8.8	7.4	6.5	6.6	7.5	8.9	10.6	11.5	11.4	9.0
Mean 3pm wind speed (km/h)	15.9	17.1	16.7	15.6	16.4	17	16.5	17.6	17	17.1	17.8	17.3	16.8

The average rainfall is approximately 400mm per year, with peak rain events occurring between December and March. Extreme rainfall events are associated with cyclonic lows that move into the area during this period. The region is generally a hot arid climate with temperatures ranging from 40°C during summer to 10°C minimums in winter.

It is assumed the Minyari TSF will be constructed on flat ground in a paddock style arrangement. The Minyari plant provides for three nominal design feed rates, however the tailings facility will be designed to accommodate approximately 20.0M. Although Case 2 will require storage of slightly less tailings material, due to the recovery of material as concentrate, the proposed combined concentrate mass (1.3%) is considered negligible with respect to TSF design.

Assuming an average dry density of 1.5t/m^3, a total LoM storage capacity of 13.3Mm^3 is required. TSF paddocks will be raised progressively by 6m to a maximum of 24m. The proposed facility will require the following civil works:

1. Clear and grub topsoil and vegetation of the vacant land.
2. Construct a clay cut-off trench underneath the starter embankment footprint.
3. Construct a starter embankment to the proposed elevation
4. Construct a decant and underdrainage facility as well as cut drainage channels to divert liquor during the early stages of development
5. Construct a seepage management system including downstream toe-drains and recovery bores.

It is proposed that constructions or lifts will occur every 1-2 years and the final TSF area will occupy approximately 92Ha. The key TSF design parameters are provided in Table 4-5.

Table 4-6: TSF Design Parameters

DESIGN ASPECT	DESIGN BASIS
Design life	7-20 years
Total tailings	20,000,000 dmt
Average in-situ dry density	1.5 t/m^3
Tailings geochemistry	NAF
Tailings slurry feed density	60 %
Average beach angle	2 °
Batter angles	
Upstream	1V:2H
Downstream	1V:3H
Crest width	6 m
Decant return	30 %
Minimum operating freeboard	0.3 m
Design storm event	1:100 annual exceedance probability (AEP) 72-h rainfall event +0.5m freeboard

Tailings will be deposited in thin discrete layers of approximately 200mm thickness from 3-5 spigots at any one time. The spigots will be distributed evenly around the TSF and will be opened progressively around the facility to develop and maintain an even beach and decant.

The TSF design for this scoping study has the following qualifications and key assumptions:

- No tailings characterisation has been conducted as part of this phase of work and key characteristics have been assumed.

- No hydrology or hydro geological studies have been conducted and a location for the proposed TSF has not been considered.
- It is assumed no tailings will be used for underground mine paste backfill.
- TSF construction materials are assumed to be locally available.
- No detailed TSF design has been conducted and the information provided is indicative only. None of the information contained within this report should be relied upon for future TSF design and should not be used to support the approvals process.

5 CAPITAL COST ESTIMATE

5.1 Battery limits

The capital equipment will be designed for a life of mine of 20 years. Bulk services such as process/ raw/ potable water, electricity and sewage are provided at plant boundary.

5.1.1 Inclusions – General

- RoM bin
- Mechanical process equipment, including plate-work, electrical and civils, required to treat ore through to doré gold bars or separate copper and cobalt concentrates
- Reagent storage
- RO water unit for concentrate washing
- Concentrate dispatch including weighbridge
- Tailings discharge pumps at plant

5.1.2 Inclusions – Buildings

- Covered flocculant preparation area
- Covered filter and concentrate handling shed
- Process workshops and stores
- Plant offices
- Gatehouse and first aid
- MCC and transformer buildings
- Compressor buildings

All in-plant buildings are as per a typical installation. No allowance has been made to include covers or enclosed buildings, including stockpiles, except where specifically stated.

5.1.3 Exclusions

- RoM pad
- Vehicles
- Mining related infrastructure
- Concentrate bagging
- Raw water recovery (Borefields)
- Water storage outside the process plant boundary

- Major overhead cranes
- Any covers for conveyors and stockpiles (stockpiles and conveyors are assumed to be uncovered)
- Bulk terracing
- Fencing
- Anything not specifically stated in the inclusions

5.2 Estimate

SM utilised its in-house database and vender estimates to provide capital cost estimates of the major mechanical equipment for the process plant only. Table 5-1 summarises the capital cost derived for each design case.

Table 5-1: Summary of process plant capital – Case 1

	COST (AUD)		
DIRECT COSTS	**1Mtpa**	**2Mtpa**	**3Mtpa**
CRUSHING	$5,788,177	$7,816,880	$9,236,255
COARSE ORE STORAGE AND RECLAIM	$3,989,083	$5,387,221	$6,365,423
GRINDING AND CLASSIFICATION	$16,187,553	$22,029,689	$24,576,335
GRAVITY	$1,516,695	$2,064,075	$2,302,683
CYANIDATION	$6,700,310	$12,396,792	$13,829,868
GOLD RECOVERY	$4,876,910	$2,026,792	$2,261,090
CARBON REGENERATION	$1,371,533	$569,994	$635,886
TAILINGS	$3,045,984	$7,198,137	$8,030,246
REAGENTS- MIXING AND DISTRIBUTION	$6,324,799	$3,345,057	$3,731,748
SITE SERVICES	$6,252,661	$2,905,535	$3,241,416
OXYGEN PLANT	$948,102	$1,896,204	$2,844,306
SUBTOTAL	**$57,001,805**	**$67,636,375**	**$77,055,257**
INDIRECT COSTS			
EPCM	$9,975,316	$11,836,366	$13,484,670
PLANT INFRASTRUCTURE	$11,000,000	$22,000,000	$33,000,000
OTHER INRASTRUCTURE (TSF)	$8,500,000	$8,500,000	$8,500,000
INSURANCES	$57,002	$67,636	$77,055
TEMPORARY WORKS	$1,140,036	$1,352,728	$1,541,105
FIRST FILL AND REAGENTS	$1,710,054	$2,029,091	$2,311,658
SPARES	$1,140,036	$1,352,728	$1,541,105
CONTINGENCY	$5,700,181	$6,763,638	$7,705,526
SUBTOTAL	**$39,222,625**	**$53,902,186**	**$68,161,119**
TOTAL	**$96,224,430**	**$121,538,561**	**$145,216,376**

Table 5-2: Summary of process plant capital – Case 2

DIRECT COSTS	COST (AUD)		
	1Mtpa	2Mtpa	3Mtpa
CRUSHING	$5,788,177	$8,279,177	$9,236,255
COARSE ORE STORAGE AND RECLAIM	$3,989,083	$5,705,826	$6,365,423
GRINDING AND CLASSIFICATION	$16,187,553	$22,029,689	$24,576,335
GRAVITY	$1,516,695	$2,064,075	$2,302,683
FLOTATION	$18,953,413	$28,728,001	$36,640,397
FINE GRIND AND CLASSIFICATION	$4,234,169	$6,417,800	$8,185,419
TAILINGS	$4,748,999	$7,198,137	$9,180,680
FLOTATION CONCENTRATE THICKENER	$945,915	$1,433,739	$1,828,626
CONCENTRATE FILTER	$10,100,656	$15,309,732	$19,526,407
REAGENTS- MIXING AND DISTRIBUTION	$3,497,980	$5,301,946	$6,762,232
SITE SERVICES	$4,674,186	$7,084,742	$9,036,053
SUBTOTAL	**$74,636,827**	**$109,552,865**	**$133,640,512**
INDIRECT COSTS			
EPCM	$13,061,445	$19,171,751	$23,387,090
PLANT INFRASTRUCTURE	$11,000,000	$22,000,000	$33,000,000
OTHER INRASTRUCTURE (TSF)	$8,500,000	$8,500,000	$8,500,000
INSURANCES	$74,637	$109,553	$133,641
TEMPORARY WORKS	$1,492,737	$2,191,057	$2,672,810
FIRST FILL AND REAGENTS	$2,239,105	$3,286,586	$4,009,215
SPARES	$1,492,737	$2,191,057	$2,672,810
CONTINGENCY	$7,463,683	$10,955,286	$13,364,051
SUBTOTAL	**$45,324,342**	**$68,405,291**	**$87,739,617**
TOTAL	**$119,961,169**	**$177,958,156**	**$221,380,129**

Costs for transport, installation, concrete, structural steel, platework and piping and instrumentation have been estimated using SM database factors as a fraction of mechanical equipment cost. An allowance for 10% contingency has been applied to the direct costs for each scenario.

Indirect costs have been factored based on scaled projects of similar size in the SM database and applied to the estimated mechanical equipment cost. An allowance has been made for process plant infrastructure only includes those things considered essential for the process. The infrastructure allowance does not include roads outside the plant area, aerodromes or camp facilities.

The TSF cost is based on earthmoving unit rates and quantity estimates. An allowance for the first stage only has been made (suitable to store approximately 7Mt). Further TSF capital allowances will need to be made as part of sustaining capital and rehabilitation costs.

The capital cost is estimated to have an accuracy of ±35%.

6 OPERATING COST

6.1 Assumptions

Process plant operating costs for both cases were compiled for the following:

- Reagents
- Grinding and crushing consumables
- Leaching, flotation and solid liquid separation consumables
- Process plant labour and administration
- Power - process plant only
- Laboratory
- Process plant maintenance and services

Reagents and grinding consumables are based on available testwork data and applied according to the resource distribution of each case.

The processing department will be responsible for all process operations from the primary crusher to the gold room/ concentrate dispatch as well as the laboratory. The total workforce in the processing department including maintenance is forecast at 69 for Case 1 and 84 for Case 2. The estimate basis consists of the expected processing and maintenance requirements on a shift basis utilising a two-week on/ one-week off basis. The estimate includes a 25% on-cost factor but excludes the boarding and FIFO components. Labour rates are referenced from the Hays Salary guide 2021 for Western Australia.

Process plant power cost has been built upon sized comminution components and estimated drive lists for minor power components. No comminution power consumption data is available and a nominal bond work index 15kWh/t has been assumed. The cost of power has been estimated at $0.30/kWh based on diesel fired generation and an average long-term fuel price of $1.55/L.

Process maintenance is derived from area specific maintenance factors of the direct equipment capital cost. A component of contract labour for major shutdown maintenance has also been included. The complete operating cost derivation is referenced in the Appendix.

6.2 Operation cost summary – Case 1

Table 6-1 summarises the operating cost for the design scenarios in Case 1. A more detailed breakdown of costs is provided in the Appendix. The estimated operating cost for the process plant ranges from $19-30/ton of ore depending on throughput rate. The major cost is associated with power and labour. Cyanide is the major consumable representing approximately $3.2/t.

Table 6-1: Summary of operating expenditure (AUD/t) – Case 1

Item	1Mtpa	2Mtpa	3Mtpa
Operating consumables	$9.23	$7.72	$7.22
Process labour	$10.77	$5.38	$3.59
Power	$8.14	$7.42	$7.21
Laboratory	$0.98	$0.49	$0.33
Maintenance materials	$1.23	$1.20	$0.87
Total	**$30.35**	**$22.21**	**$19.21**

6.3 Operation cost summary – Case 2

Table 6-2 summarises the operating cost for the design scenarios in Case 2. The estimated operating cost for the process plant ranges from $23-38/ton of ore depending on throughput rate. As with Case 1, the major cost is associated with power and labour. Sulfuric acid required to reduce the pH for cobalt flotation and sodium sulfite for sulfide depression are the major consumables representing approximately $1.8/t and $1.2/t respectively. Additional maintenance is required compared to Case 1 due to the increase of installed plant.

Table 6-2: Summary of operating expenditure (AUD/t) – Case 1

Item	1Mtpa	2Mtpa	3Mtpa
Operating consumables	$9.57	$7.94	$7.40
Process labour	$13.22	$6.61	$4.41
Power	$11.42	$9.35	$8.97
Laboratory	$0.90	$0.45	$0.30
Maintenance materials	$2.92	$2.09	$1.66
Total	**$38.03**	**$26.44**	**$22.74**

7 PRODUCT MARKETING

7.1 Doré

Gold doré will be poured and weighed on site then retained within a secure monitored safe prior to transport to the mint. The mint will return fine gold to the metals account for a minimum refining fee of $300 per bullion bar in the outturn. The mint will provide a payability for fine gold (99.9%) and silver (99%) delivered to the mint. The cost of freight, insurance, royalties and sampling has been excluded.

7.2 Copper/ gold concentrate

The market for copper/ gold concentrate is relatively transparent. As a result, copper concentrate off-take terms are more standardised and uniform with respect to payability. The payability terms do not differ greatly between smelters. The terms and costs here have been sourced from SM's in-house database and from publicly available information.

Smelters and refiners will typically pay for the copper metal contained in a concentrate at a discount to the LME price (either spot or 30day average). Contracts based on the LME price are most common, however other benchmark prices may be utilised. The payability for copper is subject to a minimum concentrate grade deduction of 1% copper unit with a maximum payability of 96.5%.

Precious metals (Au, Ag, Pt and Pd) will attract payment, provided minimum concentration thresholds are met. The Au, Pt or Pd content in concentrate must exceed 1gpt to attract a payment. Payability for each metal is in the range of 80-96% of spot price and varies between smelters. A middle range of 92.5% has been selected in line with contracts previously reviewed by SM. Silver content in concentrate must exceed 30gpt to attract a payment. A fixed payability rate of between 40-90% is typical depending on silver grade. Given the relatively low-grade concentrate expected, a lower payability has been assumed.

Deductions are charged for impurity elements in the concentrate, with the charges and concentration thresholds varying between end-users. Testwork results did not exceed typical arsenic thresholds (0.2%); however, given the mineralogy an allowance for an arsenic penalty has been made equivalent to a 0.4% As grade in concentrate.

No payment will typically be made for the cobalt content of a copper concentrate.

Benchmark treatment and refining charges are published by a variety of sources (Wood Mackenzie etc). Treatment charges are levied as a fee per dry metric ton (dmt) of concentrate smelted. Refining charges are levied as a fee per pound of copper refined. A long-term average treatment charge of US$65/ dmt and refining charges of US$0.10/ lb Cu has been assumed.

The cost of freight, insurance, royalties and sampling has been excluded. A summary of copper/ gold concentrate terms is presented in Table 7-1.

Table 7-1: Cobalt concentrate payability and refinery charges

Copper concentrate	Units	Copper	Gold	Silver
Grade	%	16.0		
Deduction	%	1.0		
Payability	%	93.8	92.5	40.0
Treatment charge	USD	\$65.0 / t_{conc}	-	-
Refining charge	USD	\$0.10 / lb_{Cu}	\$0.48 / oz_{Au}	\$0.64 / oz_{Ag}
Penalties	USD	\$5.00 / t_{conc}		
Transport	USD	-		

7.3 Cobalt concentrate

The terms and costs here have been sourced from SM's in-house database and from publicly available information, however cobalt payability is known to be volatile. The payability for cobalt in concentrate can range from 25% to 90% with the upper end reserved for intermediate hydroxide concentrates. Mineral concentrates can typically receive average payability of 75% for concentrate grades 8-10% Co. A discounted cobalt payability of 65% has been assumed based on a lower concentrate grade of 4.0% Co.

Previously reviewed concentrate terms do not provide a reference precious metal payability. The payability for gold in cobalt concentrates has been assumed to be the same as that for copper gold concentrates, provided the minimum concentration thresholds are met. No payment for copper in the cobalt concentrate will be expected at the concentrate copper grade anticipated.

The treatment and refining charges of US\$125/ dmt and US\$2.5/ lb Co has been assumed based on historical terms reviewed for similar cobalt concentrates.

The cost of freight, insurance, royalties and sampling has been excluded. A summary of cobalt concentrate terms is presented in Table 7-2.

Table 7-2: Cobalt concentrate payability and refinery charges

Copper concentrate	Units	Cobalt	Gold
Grade	%	4.0	
Deduction	%		
Payability	%	65.0	92.5
Treatment charge	USD	\$125.0 / t_{conc}	-
Refining charge	USD	\$2.50 / lb_{Co}	\$0.48 / oz_{Au}
Penalties	USD	-	
Transport	USD	-	

7.4 Toll treatment

With Minyari situated in close proximity to the operating Telfer process plant, the option to toll treat provides a low capital option to enter production. Toll treatment agreements are varied depending on many factors including, but not limited to:

- The operator
- The treatment rate
- The process plant flowsheet

In addition, the treatment charge can be fixed, consist of a fixed and variable component, or operate on a sliding scale depending on throughput. Further, this can be complicated by supplementary charges should the ore demonstrate high reagent or power consumptions. In summary, toll treatment agreements will typically consist of:

- A fixed treatment fee based on a minimum throughput.
  - Penalties apply when ore deliveries are below that stated in the agreement and is usually calculated to maintain the revenue at or above the minimum contractual throughput rate.
  - The actual throughput rate considers downtime i.e. the average campaign throughput rate is calculated as follows:

    Actual throughput = Total tonnes processed/ operational hours
- Variable/ reagents component (at cost) - Typically there is an allowance in the agreement for the standard reagents. This varies plant to plant, generally related to the water quality. Typical allowances include:
  - Lime – 7.0 kg/t
  - Cyanide – 1.0 kg/t
  - Mill media – 0.9 kg/t
  - Oxygen – $1.0 /tonne

A number of process toll treatment agreements are provided in Table 7-3.

Table 7-3: Comparable toll treatment charges

	Throughput (tph)	Fixed (AUD/t)	Variable (AUD/t)	Total (AUD/t)
Free milling gold fixed	30	55.0		55.0
Free milling gold sliding scale	130	47.0		47.0
	140	45.0		45.0
	150	43.0		43.0
Free milling gold fixed and variable	150	45.0	+Variable	+45.0
Flotation fixed and variable	180	25.0	27	52.0

The gold recovery is typically based on actual plant performance and is calculated by the change in circuit stocks plus gold in dorè. Fine gold is usually deposited by the toller into the customer's metals account, via the mint. The toller typically sells enough gold to pay the toll treatment fee and transfers the balance to the customer.

8 APPENDIX

8.1 Mass balance – Case 1: 1Mtpa

Case 1: 1Mtpa	Unit	Mill Water	Fresh Feed	Mill Feed	Mill DC Water	Mill DC	Mill Scats	Cyclone feed	CUF	COF	Gravity feed	Water to gravity	Screen U/S	Screen O/S	Gravity Conc	Gravity Tails
	Stream	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Solids	tph		125.0	312.5	0	313		313	187.5	125.0	150.0	0	135.0	15.0	0.045	135.0
Water	tph	57.2	1.9	133.9	34	134		256	62.5	193.2	122.7	100.0	210.5	12.3	0.02	210.4
Total	m^3/h	57.2	45.0	242	34.1	242		363	127.2	236.3	174.5	100.0	257.0	17.4	0.0305	257.0
	% sol	0%	98.5%	70%	0%	70%		55%	75%	39%	55%	0%	39%	55%	75%	39%
Solid																
Gold grade	gpt		1.60	10.10		10.10		9.47	15.0	1.17	9.47		9.47	9.47	1227	9.06
Mass flow																
Au	g		200	3155		3155		2959	2813	146	1420		1278	142	55	1223

	Unit	Barren Carbon	Loaded Carbon	CIL Tails	Pregnant CIL Eluate	Barren CIL Eluate	Pregnant ILR Eluate	ILR Tail	Dore	ILR Caustic (50%)	Strip Caustic (50%)	ILR NaCN (30%)	Strip NaCN (30%)	CIL NaCN (30%)	HCL (32%)	Lime
	Stream	16	17	18	19	20	21	22	23							
Solids	tph	0.04	0.04	125.0				0.05	0.0002							0.15
Water	tph			193.2			0.4	0.02		0.01	0.02	0.04	0.03	0.42	0.01	
Total	m^3/h			236.3				0.03								
	% sol			39%	0%	0%	10%	75%	100%							
Solid																
Gold grade	gpt	75.0	3000	0.19			133.6	24.5	899973							
Mass flow																
Au	g	3	126	23	122		54.1	1.10	176.5							
Recovery																
Au				11.7%				2%	88.3%							

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8.2 Mass balance – Case 1: 2Mtpa

Case 1: 2Mtpa	Unit	Mill Water	Fresh Feed	Mill Feed	Mill DC Water	Mill DC	Mill Scats	Cyclone feed	CUF	COF	Gravity feed	Water to gravity	Screen U/S	Screen O/S	Gravity Conc	Gravity Tails
	Stream	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Solids	tph		250.0	625.0	0	625		625	375.0	250.0	150.0	0	135.0	15.0	0.045	135.0
Water	tph	126.8	3.8	267.9	156	268		511	125.0	386.4	122.7	100.0	210.5	12.3	0.02	210.4
Total	m^3/h	126.8	90.0	483	155.8	483		727	254.3	472.6	174.5	100.0	257.0	17.4	0.0305	257.0
	% sol	0%	98.5%	70%	0%	70%		55%	75%	39%	55%	0%	39%	55%	75%	39%
Solid																
Gold grade	gpt		1.60	9.87		9.87		9.47	15.0	1.17	9.47		9.47	9.47	2455	8.65
Mass flow																
Au	g		400	6168		6168		5917	5626	292	1420		1278	142	110	1168
Recovery																
Au															28%	

	Unit	Barren Carbon	Loaded Carbon	CIL Tails	Pregnant CIL Eluate	Barren CIL Eluate	Pregnant ILR Eluate	ILR Tail	Dore	ILR Caustic (50%)	Strip Caustic (50%)	ILR NaCN (30%)	Strip NaCN (30%)	CIL NaCN (30%)	HCL (32%)	Lime
	Stream	16	17	18	19	20	21	22	23							
Solids	tph	0.08	0.08	250.0				0.05	0.0004							0.30
Water	tph			386.4			0.4	0.02		0.01	0.04	0.04	0.07	0.88	0.02	
Total	m^3/h			472.6				0.03								
	% sol			39%	0%	0%	10%	75%	100%							
Solid																
Gold grade	gpt	75.0	3000	0.19			267.3	49.1	899973							
Silver grade	gpt															
Mass flow																
Au	g	6	251	47	245		108.3	2.21	353.0							
Recovery																
Au				11.7%				2%	88.3%							

8.4 Mass balance – Case 1: 3Mtpa

Case 1: 3Mtpa	Unit	Mill Water	Fresh Feed	Mill Feed	Mill DC Water	Mill DC	Mill Scats	Cyclone feed	CUF	COF	Gravity feed	Water to gravity	Screen U/S	Screen O/S	Gravity Conc	Gravity Tails
	Stream	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Solids	tph		375.0	937.5	0	938		938	562.5	375.0	150.0	0	135.0	15.0	0.045	135.0
Water	tph	196.3	5.7	401.8	278	402		767	187.5	579.6	122.7	100.0	210.5	12.3	0.02	210.4
Total	m^3/h	196.3	135.0	725	277.6	725		1090	381.5	708.9	174.5	100.0	257.0	17.4	0.0305	257.0
	% sol	0%	98.5%	70%	0%	70%		55%	75%	39%	55%	0%	39%	55%	75%	39%
Solid																
Gold grade	gpt		1.60	9.79		9.79		9.47	15.0	1.17	9.47		9.47	9.47	3682	8.24
Mass flow																
Au	g		600	9180		9180		8876	8438	438	1420		1278	142	166	1112

	Unit	Barren Carbon	Loaded Carbon	CIL Tails	Pregnant CIL Eluate	Barren CIL Eluate	Pregnant ILR Eluate	ILR Tail	Dore	ILR Caustic (50%)	Strip Caustic (50%)	ILR NaCN (30%)	Strip NaCN (30%)	CIL NaCN (30%)	HCL (32%)	Lime
	Stream	16	17	18	19	20	21	22	23							
Solids	tph	0.13	0.13	375.0				0.05	0.0006							0.45
Water	tph			579.6			0.4	0.02		0.01	0.06	0.04	0.10	1.33	0.03	
Total	m^3/h			708.9				0.03								
	% sol			39%	0%	0%	10%	75%	100%							
Solid																
Gold grade	gpt	75.0	3000	0.19			400.9	73.6	899973							
Mass flow																
Au	g	9	377	70	367		162.4	3.31	529.6							
Recovery																
Au				11.7%				2%	88.3%							

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8.5 Mass balance – Case 2: 1Mtpa

Case 2: 1Mtpa	Unit	Mill Water	Fresh Feed	Mill Feed	Mill DC Water	Mill DC	Mill Scats	Cyclone feed	CUF	COF	Gravity feed	Water to gravity	Gravity Con	Gravity Tail	Dilution Water
	Stream	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Solids	tph		125.0	312.5	0	313		314	188.7	125.0	121	0	0.030	120.6	
Water	tph	69.1	1.9	133.9	98	134		257	62.9	193.8	176	100.0	0.010	276.3	0.00
Total	m^3/h	69.1	45.0	242	97.9	242		365	128.0	236.9	218	100.0	0.019	318	
	% sol	0%	98.5%	70%	0%	70%		55%	75%	39%	41%	0%	75%	30%	
Solid															
Gold grade	gpt		1.70	9.82		9.82		9.70	15.0	1.70	0.25		119	0.22	
Mass flow															
Au	g		213	3069		3069		3043	2831	213	30		4	26	

	Unit	Au/Cu Ro Feed	Au/Cu Ro Con	Ro Cons Wash Water	Ro Dil Water	Au/Cu Cln Con	Au/Cu Clnr Wash Water	Au/Cu Cln Tail	Co Ro Feed	Co Ro Con	Co Clnr Wash Water	Co Cln Con	Co Cln Tail	Combined Tail	Tail Thick UF	Tail Thick OF
	Stream	15	16	17	18	21	22	23	18	19	24	25	26	20	27	28
Solids	tph	125	4	0	0	1.20	0	3	121	1	0	0.46	1	123	123	0
Water	tph	194	18	8	129	24.8	20.0	12.7	276	5	4	2	7	328	82	246
Total	m^3/h	237	19	8	129	25.2	20.0	14	318	5	4	2	7	371	125	246
	% sol	39%	20%	0%	0%	5%	0%	20%	30%	20%	0%	20%	10%	27%	60%	0%
Gold grade	gpt	1.6	14			135		0.03	0.22	4.0		30	1.5	0.20	0.20	
Silver grade	gpt	0.5	12			46		0.01	0.05	5.0		14.8	2.6	0.03	0.03	
Copper Grde	%	0.19	5.0			16.0		0.83	1.55	1.0		1.54	0.6	0.03	0.03	
Cobalt Grade	%	0.03	0.14			0.00		0.15	2.60	2.0		4.00	0.4	0.01	0.01	
Mass flow	(%)	100	3.50			0.96		2.54	96.5	1.00		0.37	0.013	98.7	98.67	
Au	g	200	170			162		8.3	26.4	16		14.1	1.93	24.2	24.2	
Ag	g	66	60			55		4.2	6.6	7		6.8	0.44	4.0	3.98	
Cu	t	0.24	0.22			0.19		0.03	0.0	0.01		0.01	0.01	0.04	0.04	
Co	t	0.04	0.01			0.00		0.00	0.0	0.03		0.02	0.01	0.02	0.02	
Recovery																
Au						80.9%						7.03%			12.1%	
Ag						83.7%						10.34%			6.01%	
Cu						81.0%						3.00%			16.0%	
Co						4.00%						49.4%			46.6%	
						Product						Product			Tail	

8.6 Mass balance – Case 2: 2Mtpa

Case 2: 2Mtpa	Unit	Mill Water	Fresh Feed	Mill Feed	Mill DC Water	Mill DC	Mill Scats	Cyclone feed	CUF	COF	Gravity feed	Water to gravity	Gravity Con	Gravity Tail	Dilution Water
	Stream	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Solids	tph		250.0	625.0	0	625		627	377.4	250.0	241	0	0.060	241.2	
Water	tph	138.2	3.8	267.9	216	268		513	125.8	387.5	353	100.0	0.020	452.5	0.00
Total	m^3/h	138.2	90.0	483	215.9	483		730	255.9	473.7	436	100.0	0.037	536	
	% sol	0%	98.5%	70%	0%	70%		55%	75%	39%	41%	0%	75%	35%	
Solid															
Gold grade	gpt		1.70	9.82		9.82		9.70	15.0	1.70	0.25		119	0.22	
Mass flow															
Au	g		425	6139		6139		6086	5661	425	60		7	53	

	Unit	Au/Cu Ro Feed	Au/Cu Ro Con	Ro Cons Wash Water	Ro Dil Water	Au/Cu Cln Con	Au/Cu Clnr Wash Water	Au/Cu Cln Tail	Co Ro Feed	Co Ro Con	Co Clnr Wash Water	Co Cln Con	Co Cln Tail	Combined Tail	Tail Thick UF	Tail Thick OF
	Stream	15	16	17	18	21	22	23	18	19	24	25	26	20	27	28
Solids	tph	250	9	0	0	2.41	0	6	241	3	0	0.93	2	247	247	0
Water	tph	388	35	16	258	29.6	20.0	25.4	453	10	7	4	14	656	164	492
Total	m^3/h	474	38	16	258	30.4	20.0	28	536	11	7	4	14	741	250	492
	% sol	39%	20%	0%	0%	8%	0%	20%	35%	20%	0%	20%	10%	27%	60%	0%
Gold grade	gpt	1.6	14			135		0.03	0.22	4.0		30	1.5	0.20	0.20	
Silver grade	gpt	0.5	12			46		0.01	0.05	5.0		14.8	2.6	0.03	0.03	
Copper Grde	%	0.19	5.0			16.0		0.83	1.55	1.0		1.54	0.6	0.03	0.03	
Cobalt Grade	%	0.03	0.14			0.00		0.15	2.60	2.0		4.00	0.4	0.01	0.01	
Mass flow	(%)	100	3.50			0.96		2.54	96.5	1.00		0.37	0.013	98.7	98.67	
Au	g	400	340			323		16.5	52.8	32		28.1	3.87	48.4	48.4	
Ag	g	133	119			111		8.4	13.3	15		13.7	0.88	8.0	7.96	
Cu	t	0.48	0.44			0.38		0.05	0.0	0.03		0.01	0.01	0.08	0.08	
Co	t	0.08	0.01			0.00		0.01	0.1	0.05		0.04	0.01	0.03	0.03	
Recovery																
Au						80.9%						7.03%			12.1%	
Ag						83.7%						10.34%			6.01%	
Cu						81.0%						3.00%			16.0%	
Co						4.00%						49.4%			46.6%	
						Product						Product			Tail	

8.7 Mass balance – Case 2: 3Mtpa

Case 2: 3Mtpa	Unit	Mill Water	Fresh Feed	Mill Feed	Mill DC Water	Mill DC	Mill Scats	Cyclone feed	CUF	COF	Gravity feed	Water to gravity	Gravity Con	Gravity Tail	Dilution Water
	Stream	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Solids	tph		375.0	937.5	0	938		941	566.1	375.0	362	0	0.090	361.8	
Water	tph	207.3	5.7	401.8	334	402		770	188.7	581.3	529	100.0	0.030	628.8	0.00
Total	m^3/h	207.3	135.0	725	333.8	725		1095	383.9	710.6	654	100.0	0.056	754	
	% sol	0%	98.5%	70%	0%	70%		55%	75%	39%	41%	0%	75%	37%	
Solid															
Gold grade	gpt		1.70	9.82		9.82		9.70	15.0	1.70	0.25		119	0.22	
Mass flow															
Au	g		638	9208		9208		9129	8492	638	90		11	79	

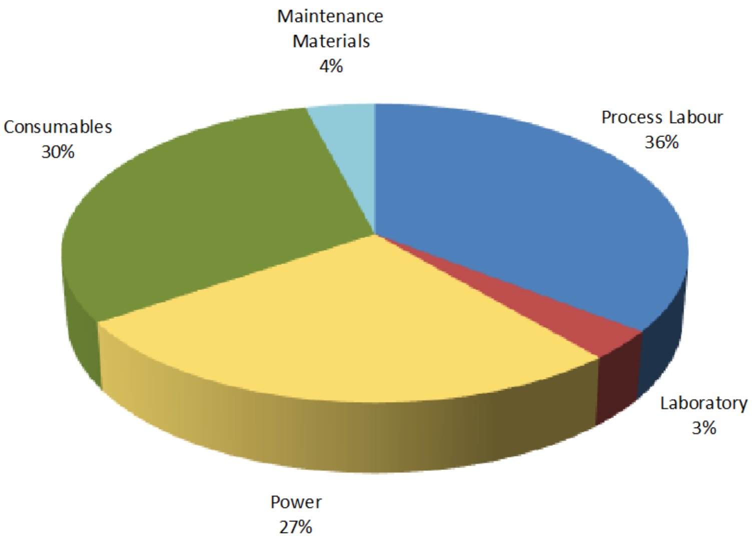
	Unit	Au/Cu Ro Feed	Au/Cu Ro Con	Ro Cons Wash Water	Ro Dil Water	Au/Cu Cln Con	Au/Cu Clnr Wash Water	Au/Cu Cln Tail	Co Ro Feed	Co Ro Con	Co Clnr Wash Water	Co Cln Con	Co Cln Tail	Combined Tail	Tail Thick UF	Tail Thick OF
	Stream	15	16	17	18	21	22	23	18	19	24	25	26	20	27	28
Solids	tph	375	13	0	0	3.61	0	10	362	4	0	1.39	2	370	370	0
Water	tph	581	53	24	388	34.4	20.0	38.1	629	15	11	6	21	984	247	737
Total	m^3/h	711	57	24	388	35.7	20.0	41	754	16	11	6	21	1112	374	737
	% sol	39%	20%	0%	0%	9%	0%	20%	37%	20%	0%	20%	10%	27%	60%	0%
Gold grade	gpt	1.6	14			135		0.03	0.22	4.0		30	1.5	0.20	0.20	
Silver grade	gpt	0.5	12			46		0.01	0.05	5.0		14.8	2.6	0.03	0.03	
Copper Grde	%	0.19	5.0			16.0		0.83	1.55	1.0		1.54	0.6	0.03	0.03	
Cobalt Grade	%	0.03	0.14			0.00		0.15	2.60	2.0		4.00	0.4	0.01	0.01	
Mass flow	(%)	100	3.50			0.96		2.54	96.5	1.00		0.37	0.013	98.7	98.67	
Au	g	600	510			485		24.8	79.2	48		42.2	5.80	72.6	72.6	
Ag	g	199	179			166		12.6	19.9	22		20.5	1.31	11.9	11.94	
Cu	t	0.71	0.66			0.58		0.08	0.1	0.04		0.02	0.02	0.11	0.11	
Co	t	0.11	0.02			0.00		0.01	0.1	0.08		0.06	0.02	0.05	0.05	
Recovery																
Au						80.9%						7.03%			12.1%	
Ag						83.7%						10.34%			6.01%	
Cu						81.0%						3.00%			16.0%	
Co						4.00%						49.4%			46.6%	
						Product						Product			Tail	

Project: Minyari Dome Gold Project
Client: Antipa
Description: High-level cost estimation
Rev: DRAFT

Plant throughput 1,000,000 tpa

OPERATING COST SUMMARY

	Total Cost		% Fixed	Fixed		% Variable	Variable	
	AUD$/yr	AUD$/t		AUD$/yr	AUD$/t		AUD$/yr	AUD$/t
Operating Consumables	$ 9,226,930	$ 9.23	0%	$ -	$ -	100%	$ 9,226,930	$ 9.23
Process Labour	$ 10,768,400	$ 10.77	100%	$ 10,768,400	$ 10.77	0%	$ -	$ -
Power	$ 8,140,772	$ 8.14	30%	$ 2,433,222	$ 2.43	70%	$ 5,707,550	$ 5.71
Laboratory	$ 981,110	$ 0.98	80%	$ 784,888	$ 0.78	20%	$ 196,222	$ 0.20
Maintenance Materials	$ 1,234,632	$ 1.23	55%	$ 673,853	$ 0.67	45%	$ 560,779	$ 0.56
TOTAL PROCESSING COST	$ 30,351,844	$ 30.35	48%	$ 14,660,363	$ 14.66	52%	$ 15,691,481	$ 15.69



8.8 Detailed operating cost – Case 1: 1Mtpa

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Plant throughput 1,000,000 tpa

PROCESS CONSUMABLES COST SUMMARY

Operating Consumable	Consumable	Consumption rate (Unit/measure)	Annual consumption (Unit/annum)	UOM	Delivery size	Consumable item direct costs			Total Cost	Totals	Supplier
						Supplied Cost AUD$/unit	Transport AUD$/unit	Cost to site AUD$/unit	AUD$/unit	Consumable cost $/annum	
Crushing											
Primary Crusher	*Complete*	4.1 set(s)/y	4.1 set(s)/y	set	1	$ 25,000	$ 2,500	$ 27,500	$ 27,500	$ 112,420	Metso
Grinding									$ -		
SAG Mill	*Wear Liners*	1.5 set(s)/y	1.5 set(s)/y	set	1	$ 1,000,000	$ 10,000	$ 1,010,000	$ 1,010,000	$ 1,515,000	Warman
	Grinding Media	0.210 kg/t	210tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ 378,000	Orica
Ball Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 600,000	$ 10,000	$ 610,000	$ 610,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Ball Mill- Limestone	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 400,000	$ 10,000	$ 410,000	$ 410,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Tower Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 100,000	$ 10,000	$ 110,000	$ 110,000	$ -	
	Impeller consumables			lot				$ -	$ -	$ -	
	Grinding Media	0.000 kg/t	0tpa	t	5	$ 2,500	$ 300	$ 2,800	$ 2,800	$ -	Metso
Pebble Crusher	*Mantle/Concave Set*	4.0 set(s)/y	4.0 set(s)/y	set	1	$ 50,000	$ 2,500	$ 52,500	$ 52,500	$ 210,000	Metso
Concentrate Filtration											
Filter Components	*Cloths*		0 cloths/y	set	60	$ 208	$ 8	$ 216	$ 216	$ -	
Filter Components	*Plates*		0.0 set(s)/y	set		$ 10,000	$ 500	$ 10,500	$ 10,500	$ -	Metso
Reagents									$ -		
Potassium Amyl Xanthate	*Flotation*	0.00 kg/t	0tpa	t	20	$ 2,400	$ 300	$ 2,700	$ 2,700	$ -	Orica
Frother	*Flotation*	0.00 kg/t	0tpa	t	20	$ 4,700	$ 300	$ 5,000	$ 5,000	$ -	Orica
Copper sulphate	*Flotation/ Cyanide Destruct*	0.00 kg/t	0tpa	t	20	$ 3,090	$ 300	$ 3,390	$ 3,390	$ -	Database
Quicklime	*Flotation/ Cyanidation*	1.20 kg/t	1,200tpa	t	20			$ 290	$ 290	$ 348,000	Cockburn Cement
Limestone	*Neutralisation*		0tpa	t	27			$ 120	$ 120	$ -	WA Limestone
Sulfuric acid	*POX*	0.00 kg/t	0tpa	t	20			$ 90	$ 90	$ -	Database
Oxygen	*POX/ Cyanidation*		0tpa	t							BOC
Sodium Cyanide	*Cyanidation*	1.07 kg/t	1,070tpa	t	20			$ 3,000	$ 3,000	$ 3,210,000	CSBP
Activated Carbon	*Cyanidation*	0.03 kg/t	26tpa	t	20	$ 2,455	$ 300	$ 2,755	$ 2,755	$ 71,630	Haycarb
Sodium Hydroxide	*Elution*	0.22 kg/t	220tpa	t	20	$ 320	$ 160	$ 480	$ 480	$ 105,600	Coogee Chemicals
Hydrochloric acid	*Elution*	0.13 kg/t	133tpa	t	20			$ 610	$ 610	$ 81,333	Coogee Chemicals
Hydrogen peroxide	*Cyanide Destruct*	1.31 kg/t	1,307tpa	t	20			$ 1,247	$ 1,247	$ 1,629,946	Evonik
Lead Nitrate	*Pyrite leach*		0tpa	t		$ 2,620	$ 300	$ 2,920	$ 2,920	$ -	Esease
Flocculant	*Thickening*	0.10 kg/t	100tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 390,000	Ciba
Water Treatment and Cleaning											
Water Treatment	*Potable Water*	100,000 kL/yr	100,000 kL/yr	kL					$ 0	$ 15,000	TBA
Antiscalant	*Decant Return Water*	18,000 L/yr	18,000 L/yr	t	TBA	$ 2,500	$ -	$ 2,500	$ 2,500	$ 45,000	TBA
Antiscalant	*Raw water*	12,000 L/yr	12,000 L/yr	t	TBA	$ 4,100	$ -	$ 4,100	$ 4,100	$ 49,200	TBA
Cooling Tower dosing pack	*Allowance*			lot						$ -	
Sulphamic Acid	*Cleaning*	0 kg/yr	0 kg/yr	t	TBA	$ 1,880	$ -	$ 1,880	$ 1,880	$ -	TBA
General											
Mill Lubricants	*Allowance*	$ 150,000	$ 150,000	lot		$ 150,000	$ 2,500	$ 152,500	$ 152,500	$ 152,500	TBA
Cyclone spares	*Allowance*	$ 30,000	$ 30,000	lot		$ 30,000	$ 1,000	$ 31,000	$ 31,000	$ 31,000	TBA
Mobile and hire equipment	*Allowance*	$ 300,000	$ 300,000	lot		$ 300,000		$ 300,000	$ 300,000	$ 300,000	TBA
General Supplies	*Allowance*	$ 50,000	$ 50,000	lot		$ 50,000	$ 1,000	$ 51,000	$ 51,000	$ 51,000	TBA
Operator Consumables	*Allowance*	$ 7,600	$ 7,600	person		$ 7,600	$ 100	$ 7,700	$ 7,700	$ 531,300	TBA
TOTAL CONSUMABLE COST										$ 9,226,930	

Notes:

1.) Excludes Mining Cost

2.) Transport cost allowance of $300 per tonne

3.) Assume municipal water supply for potable water, no cost

Plant throughput 1,000,000 tpa

POWER COST SUMMARY

Area	Power		Consumption		Cost	
	Installed	Average Continuous Draw	Annual	Rate	Annual	Rate
	(kW)	(kW)	(kW)	(kWh/t)	(AUD$)	AUD$/t
Crushing	480	235	2,060,352	2.06	$ 622,788	$ 0.62
Coarse Ore Storage	96	61	537,600	0.54	$ 162,502	$ 0.16
Grinding & Classification	2407	1963	17,198,791	17.20	$ 5,198,725	$ 5.20
Flotation	0	0	-	0.00	$ -	$ -
Flotation Tails Thickener and Process Water Recovery	0	0	-	0.00	$ -	$ -
Fine Grinding	0	0	-	0.00	$ -	$ -
Cyanidation	478	364	3,189,261	3.19	$ 964,027	$ 0.96
Cyanidation Tailings Thickening and Process Water Recovery	79	25	222,587	0.22	$ 67,282	$ 0.07
Elution and Goldroom	49	33	292,776	0.29	$ 88,498	$ 0.09
Carbon Regeneration	41	13	112,000	0.11	$ 33,855	$ 0.03
Reagents Area	296	139	1,214,924	1.21	$ 367,238	$ 0.37
Water Services Total	284	126	1,102,720	1.10	$ 333,322	$ 0.33
Air Services Total	126	50	438,757	0.44	$ 132,624	$ 0.13
Oxygen Plant	55	46	404,800	0.40	$ 122,360	$ 0.12
Administration, Workshop and Store Total	10	7	57,956	0.06	$ 17,519	$ 0.12
Laboratory Total	18	11	99,353	0.10	$ 30,032	$ 0.03
TOTAL	4,419	3,074	26,931,878	26.93	$ 8,140,772	$ 8.25

LABOUR COST (CONTRACT MAINTENANCE)

Title	Category	Number	Days	Hours/Day	Rate (AUD$/h)	Total Cost (AUD$)	Roster /year
General							
Monthly	Mechanical Trades	0	3	12	$ 100	$ -	12
	Electrical Trades	0	3	12	$ 120	$ -	12
3 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	4
	Electrical Trades	0	3	12	$ 120	$ -	4
6 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	2
	Electrical Trades	0	3	12	$ 120	$ -	2
Mill Relines							
6 Monthly	Mechanical Trades	12	2	12	$ 100	$ 57,600	2
12 Monthly	Mechanical Trades	24	4	12	$ 100	$ 115,200	1
Crusher							
Monthly	Mechanical Trades	12	2	12	$ 100	$ 345,600	12
TOTAL		48	26			$ 518,400	
					Unit Cost AUD$/t	$ 0.52	

Plant throughput 1,000,000 tpa

LABOUR COST SUMMARY (STAFF)

Position	Number	Salary each (AUD$)	Total (AUD$)	On Cost factor	Total Cost (AUD$)	Roster on:off
Production						
Processing Plant Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Production Supernintendent	1	$ 200,000	$ 200,000	1.25	$ 250,000	2:1
Production Co-ordinator	2	$ 180,000	$ 360,000	1.25	$ 450,000	2:1
Senior Metallurgist	1	$ 150,000	$ 150,000	1.25	$ 187,500	2:1
Metallurgist	2	$ 130,000	$ 260,000	1.25	$ 325,000	2:1
Laboratory Manager	0	$ 130,000	$ -	1.25	$ -	2:1
Laboratory Technicians		$ 100,000	$ -	1.25	$ -	2:1
Shift Supervisor	3	$ 115,000	$ 345,000	1.25	$ 431,250	2:1
Process Technician (shift)	15	$ 100,000	$ 1,500,000	1.25	$ 1,875,000	2:1
Process Technician (day)	3	$ 100,000	$ 300,000	1.25	$ 375,000	2:1
ROM Loader Operater	3	$ 105,000	$ 315,000	1.25	$ 393,750	2:1
Sub-total	31		$ 3,680,000		$ 4,600,000	
Maintenance						
Maintenance Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Maintenance Superintendent	1	$ 180,000	$ 180,000	1.25	$ 225,000	2:1
Maintenance Planner	1	$ 150,000	$ 150,000	1.25	$ 187,500	2:1
Mechanical Maintenance Superviso	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Maintenance Leading Hand	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Mechanical Fitter	3	$ 110,000	$ 330,000	1.25	$ 412,500	2:1
Apprentice Fitter	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Boilermaker Welder	3	$ 110,000	$ 330,000	1.25	$ 412,500	2:1
Apprentice Boilermaker	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Electrical Maintenance Supervisor	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Electrician/Instrument Technician	3	$ 130,000	$ 390,000	1.25	$ 487,500	2:1
Apprentice Electrician	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Trades Assistants	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Sub-total	20		$ 2,430,000		$ 3,037,500	
Admin						
General Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Commercial Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
OHS and Enviromental Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
Enviromental Supernintendent	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Accountant	1	$ 110,000	$ 110,000	1.25	$ 137,500	0:00
OHS Officer	2	$ 110,000	$ 220,000	1.25	$ 275,000	0:00
Enviromental Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Storeman	3	$ 100,000	$ 300,000	1.25	$ 375,000	0:00
Admin	2	$ 80,000	$ 160,000	1.25	$ 200,000	0:00
Training Coordinator	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Purchasing Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	0:00
Sub-total	18		$ 2,090,000		$ 2,612,500	
TOTAL	69		$ 6,110,000		$ 10,250,000	
				Unit cost AUD$/t	$ 10.25	

Notes:
1. All shift personnel working 12 hour shifts
2. All Personnel FIFO
3. On cost factor includes superannuation, payroll tax and workers compensation insurance
4. Shift operators are as follows: control room (1), crushing and grinding (1), flotation (0), CIL(1), reagents and dewatering (1), elution and goldroom (1).
5. Shift operators are allocated as follows: process technicians (20), shift supervisors (3) and ROM loader operator (4)
6. No accommodation or flight costs are included

strategic METALLURGY

Plant throughput 1,000,000 tpa

LABORATORY COST SUMMARY

Shifts per day 2

Assay Requirement	Shift	Daily	Weekly	Monthly	Total Assays	Outside %	Internal %	External AUD$/sample	Internal AUD$/sample	External AUD$/y	Internal AUD$/y	TOTAL AUD$/y
Solids Assays												
Mill Feed - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Flotation feed-Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Rougher Concentrate - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Scavenger Tailings - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Cleaner Tailings - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Cleaner Concentrate - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
POX feed - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Feed - Au, S, S2-	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Metallurgical Testing (flotation)- Ni, Cu, Fe, Mg				10	2,400	50%	50%	$ 60	$ 100	$ 75,000	$ 60,000	$ 135,000
Solution Assays												
ILR PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Neutralisation Feed		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Neutralisation Tails		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Tk 1- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Adsorbance Tk 1- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au, Free CN, WAD CN	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Elution PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Elution BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Carbon Assays												
Adsorbance Tk 1- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
Loaded Carbon- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
Barren Carbon- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
GIC- Solid Assays												
Concentrate Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut filter feed tank- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 1 - Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Solutions												
Leach Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Carbon												
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Miscellaneous												
Mill Feed Moisture	1				730	0%	100%	$ 20	$ 8	$ -	$ 5,475	$ 5,475
Flotation Concentrate Sizing	1		1	1	794	0%	100%	$ 30	$ 8	$ -	$ 5,955	$ 5,955
Environmental Samples			5	10	380	0%	100%	$ 30	$ 10	$ -	$ 3,800	$ 3,800
Water Quality Samples			2	2	128	0%	100%	$ 30	$ 10	$ -	$ 1,280	$ 1,280
Sulphur assays	6				4,380	0%	100%	$ 30	$ 15	$ -	$ 65,700	$ 65,700
Metallurgical Testing				10	120	50%	50%	$ 1,000	$ 1,000	$ 60,000	$ 60,000	$ 120,000
Mine Grade Control												
Grade Control		50			18,250	0%	100%	$ 30	$ 15	$ -	$273,750	$ 273,750
Subtotal					54,697					$135,000	$751,110	$ 886,110
Replacement Glassware												$ 45,000
Miscellaneous												$ 50,000
TOTAL												$ 981,110

NOTES:

1. Grade Control Sampling Cost excluded

MAINTENANCE COST SUMMARY

Area	Capital Cost (Supply) AUD$	Maintenance Consumables Factor (%)	Maintenance Consumables Cost (AUD$/year)	% Fixed	Maintenance Cost Fixed (AUD$/year)
Plant Maintenance					
CRUSHING	$ 1,219,245	6.0%	$ 73,155	40%	$ 29,262
COARSE ORE STORAGE AND RECLAIM	$ 840,276	6.0%	$ 50,417	40%	$ 20,167
GRINDING AND CLASSIFICATION	$ 5,848,755	6.0%	$ 350,925	40%	$ 140,370
GRAVITY	$ 548,000	6.0%	$ 32,880	40%	$ 13,152
FLOTATION	$ -	6.0%	$ -	40%	$ -
FINE GRIND AND CLASSIFICATION	$ -	6.0%	$ -	40%	$ -
CYANIDATION	$ 2,420,901	6.0%	$ 145,254	40%	$ 58,102
GOLD RECOVERY	$ 1,762,085	6.0%	$ 105,725	40%	$ 42,290
CARBON REGENERATION	$ 495,551	3.0%	$ 14,867	40%	$ 5,947
TAILINGS	$ 1,100,550	3.0%	$ 33,017	40%	$ 13,207
FLOTATION CONC THICKENER	$ -	3.0%	$ -	40%	$ -
CONC FILTER	$ -	3.0%	$ -	40%	$ -
REAGENTS- MIXING AND DISTRIBUTION	$ 2,001,304	3.0%	$ 60,039	40%	$ 24,016
SITE SERVICES	$ 1,978,478	3.0%	$ 59,354	40%	$ 23,742
OXYGEN PLANT	$ 300,000	3.0%	$ 9,000	40%	$ 3,600
			$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
Mobile Equipment			$ -	80%	$ -
Maintenance General					
Maintenance software			$ 100,000	100%	$ 100,000
Maintenance manuals			$ 100,000	100%	$ 100,000
Maintenance training			$ 100,000	100%	$ 100,000
Contract Labour					
Hire equipment service agreements			$ -	100%	$ -
SAG Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
Ball Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
TOTAL			$ 1,234,632		$ 673,853

NOTES:

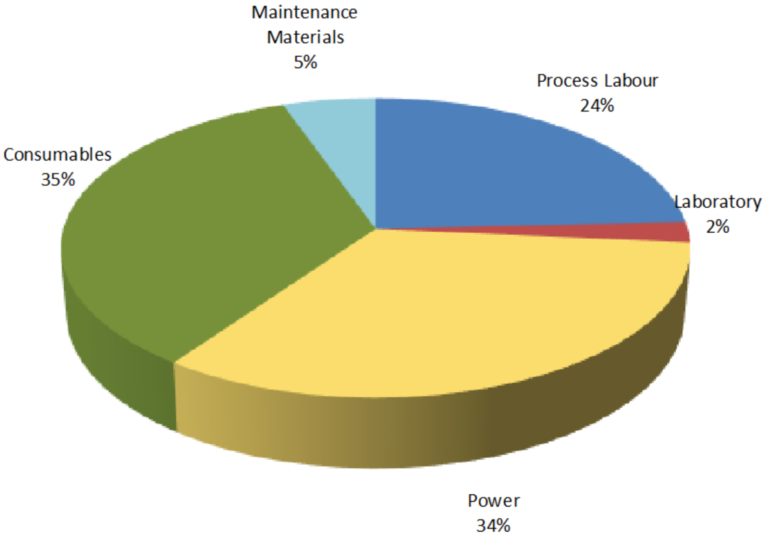
1. Mobile equipment maintenance excluded
2. Maintenance Cost Estimate based on Capital Cost Estimate

8.9 Detailed operating cost – Case 1: 2Mtpa

Project:	Minyari Dome Gold Project
Client:	Antipa
Description:	High-level cost estimation
Rev:	DRAFT
Plant throughput	2,000,000 tpa

OPERATING COST SUMMARY

	Total Cost		% Fixed	Fixed		% Variable	Variable	
	AUD$/yr	AUD$/t		AUD$/yr	AUD$/t		AUD$/yr	AUD$/t
Operating Consumables	$ 15,441,439	$ 7.72	0%	$ -	$ -	100%	$ 15,441,439	$ 7.72
Process Labour	$ 10,768,400	$ 5.38	100%	$ 10,768,400	$ 5.38	0%	$ -	$ -
Power	$ 14,837,281	$ 7.42	30%	$ 4,442,175	$ 2.22	70%	$ 10,395,107	$ 5.20
Laboratory	$ 981,110	$ 0.49	80%	$ 784,888	$ 0.39	20%	$ 196,222	$ 0.10
Maintenance Materials	$ 2,395,850	$ 1.20	34%	$ 813,100	$ 0.41	66%	$ 1,582,750	$ 0.79
TOTAL PROCESSING COST	$ 44,424,081	$ 22.21	38%	$ 16,808,563	$ 8.40	62%	$ 27,615,518	$ 13.81



Plant throughput 2,000,000 tpa

PROCESS CONSUMABLES COST SUMMARY

Operating Consumable	Consumable	Consumption rate (Unit/measure)	Annual consumption (Unit/annum)	UOM	Delivery size	Consumable item direct costs			Total Cost	Totals	Supplier
						Supplied Cost AUD$/unit	Transport AUD$/unit	Cost to site AUD$/unit	AUD$/unit	Consumable cost $/annum	
Crushing											
Primary Crusher	*Complete*	4.1 set(s)/y	4.1 set(s)/y	set	1	$ 25,000	$ 2,500	$ 27,500	$ 27,500	$ 112,420	Metso
Grinding									$ -		
SAG Mill	*Wear Liners*	1.5 set(s)/y	1.5 set(s)/y	set	1	$ 1,000,000	$ 10,000	$ 1,010,000	$ 1,010,000	$ 1,515,000	Warman
	Grinding Media	0.210 kg/t	420tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ 756,000	Orica
Ball Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 600,000	$ 10,000	$ 610,000	$ 610,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Ball Mill- Limestone	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 400,000	$ 10,000	$ 410,000	$ 410,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Tower Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 100,000	$ 10,000	$ 110,000	$ 110,000	$ -	
	Impeller consumables			lot				$ -	$ -	$ -	
	Grinding Media	0.000 kg/t	0tpa	t	5	$ 2,500	$ 300	$ 2,800	$ 2,800	$ -	Metso
Pebble Crusher	*Mantle/Concave Set*	4.0 set(s)/y	4.0 set(s)/y	set	1	$ 50,000	$ 2,500	$ 52,500	$ 52,500	$ 210,000	Metso
Concentrate Filtration											
Filter Components	*Cloths*		0 cloths/y	set	60	$ 208	$ 8	$ 216	$ 216	$ -	
Filter Components	*Plates*		0.0 set(s)/y	set		$ 10,000	$ 500	$ 10,500	$ 10,500	$ -	Metso
Reagents									$ -		
Potassium Amyl Xanthate	*Flotation*	0.00 kg/t	0tpa	t	20	$ 2,400	$ 300	$ 2,700	$ 2,700	$ -	Orica
Frother	*Flotation*	0.00 kg/t	0tpa	t	20	$ 4,700	$ 300	$ 5,000	$ 5,000	$ -	Orica
Copper sulphate	*Flotation/ Cyanide Destruct*	0.00 kg/t	0tpa	t	20	$ 3,090	$ 300	$ 3,390	$ 3,390	$ -	Database
Quicklime	*Flotation/ Cyanidation*	1.20 kg/t	2,400tpa	t	20			$ 290	$ 290	$ 696,000	Cockburn Cement
Limestone	*Neutralisation*		0tpa	t	27			$ 120	$ 120	$ -	WA Limestone
Sulfuric acid	*POX*	0.00 kg/t	0tpa	t	20			$ 90	$ 90	$ -	Database
Oxygen	*POX/ Cyanidation*		0tpa	t							BOC
Sodium Cyanide	*Cyanidation*	1.07 kg/t	2,140tpa	t	20			$ 3,000	$ 3,000	$ 6,420,000	CSBP
Activated Carbon	*Cyanidation*	0.03 kg/t	52tpa	t	20	$ 2,455	$ 300	$ 2,755	$ 2,755	$ 143,260	Haycarb
Sodium Hydroxide	*Elution*	0.22 kg/t	440tpa	t	20	$ 320	$ 160	$ 480	$ 480	$ 211,200	Coogee Chemicals
Hydrochloric acid	*Elution*	0.13 kg/t	267tpa	t	20			$ 610	$ 610	$ 162,667	Coogee Chemicals
Hydrogen peroxide	*Cyanide Destruct*	1.31 kg/t	2,614tpa	t	20			$ 1,247	$ 1,247	$ 3,259,893	Evonik
Lead Nitrate	*Pyrite leach*		0tpa	t		$ 2,620	$ 300	$ 2,920	$ 2,920	$ -	Esease
Flocculant	*Thickening*	0.10 kg/t	200tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 780,000	Ciba
Water Treatment and Cleaning											
Water Treatment	*Potable Water*	100,000 kL/yr	100,000 kL/yr	kL					$ 0	$ 15,000	TBA
Antiscalant	*Decant Return Water*	18,000 L/yr	18,000 L/yr	t	TBA	$ 2,500	$ -	$ 2,500	$ 2,500	$ 45,000	TBA
Antiscalant	*Raw water*	12,000 L/yr	12,000 L/yr	t	TBA	$ 4,100	$ -	$ 4,100	$ 4,100	$ 49,200	TBA
Cooling Tower dosing pack	*Allowance*			lot						$ -	
Sulphamic Acid	*Cleaning*	0 kg/yr	0 kg/yr	t	TBA	$ 1,880	$ -	$ 1,880	$ 1,880	$ -	TBA
General											
Mill Lubricants	*Allowance*	$ 150,000	$ 150,000	lot		$ 150,000	$ 2,500	$ 152,500	$ 152,500	$ 152,500	TBA
Cyclone spares	*Allowance*	$ 30,000	$ 30,000	lot		$ 30,000	$ 1,000	$ 31,000	$ 31,000	$ 31,000	TBA
Mobile and hire equipment	*Allowance*	$ 300,000	$ 300,000	lot		$ 300,000		$ 300,000	$ 300,000	$ 300,000	TBA
General Supplies	*Allowance*	$ 50,000	$ 50,000	lot		$ 50,000	$ 1,000	$ 51,000	$ 51,000	$ 51,000	TBA
Operator Consumables	*Allowance*	$ 7,600	$ 7,600	person		$ 7,600	$ 100	$ 7,700	$ 7,700	$ 531,300	TBA
TOTAL CONSUMABLE COST										$ 15,441,439	

Notes:

1.) Excludes Mining Cost

2.) Transport cost allowance of $300 per tonne

3.) Assume municipal water supply for potable water, no cost

strategic METALLURGY

Plant throughput 2,000,000 tpa

POWER COST SUMMARY

Area	Power		Consumption		Cost	
	Installed	Average Continuous Draw	Annual	Rate	Annual	Rate
	(kW)	(kW)	(kW)	(kWh/t)	(AUD$)	AUD$/t
Crushing	720	353	3,090,528	1.55	$ 934,182	$ 0.47
Coarse Ore Storage	144	92	806,400	0.40	$ 243,753	$ 0.12
Grinding & Classification	4628	3809	33,364,162	16.68	$ 10,085,076	$ 5.04
Flotation	0	0	-	0.00	$ -	$ -
Flotation Tails Thickener and Process Water Recovery	0	0	-	0.00	$ -	$ -
Fine Grinding	0	0	-	0.00	$ -	$ -
Cyanidation	868	686	6,006,861	3.00	$ 1,815,710	$ 0.91
Cyanidation Tailings Thickening and Process Water Recovery	140	41	355,067	0.18	$ 107,327	$ 0.05
Elution and Goldroom	54	38	331,752	0.17	$ 100,280	$ 0.05
Carbon Regeneration	62	22	196,000	0.10	$ 59,245	$ 0.03
Reagents Area	375	174	1,524,000	0.76	$ 460,664	$ 0.23
Water Services Total	440	191	1,676,800	0.84	$ 506,851	$ 0.25
Air Services Total	296	109	958,624	0.48	$ 289,766	$ 0.14
Oxygen Plant	84	71	618,240	0.31	$ 186,877	$ 0.09
Administration, Worksh[illegible]					17,519	$ 0.09
Laboratory Total					30,032	$ 0.02
TOTAL					4,837,281	$ 7.50

Plant throughp 2,000,000 tpa

LABOUR COST SUMMARY (STAFF)

Position	Number	Salary each (AUD$)	Total (AUD$)	On Cost factor	Total Cost (AUD$)	Roster on:off
Production						
Processing Plant Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1

LABOUR COST (CONTRACT MAINTENANCE)

Title	Category	Number	Days	Hours/Day	Rate (AUD$/h)	Total Cost (AUD$)	Roster /year
General							
Monthly	Mechanical Trades	0	3	12	$ 100	$ -	12
	Electrical Trades	0	3	12	$ 120	$ -	12
3 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	4
	Electrical Trades	0	3	12	$ 120	$ -	4
6 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	2
	Electrical Trades	0	3	12	$ 120	$ -	2
Mill Relines							
6 Monthly	Mechanical Trades	12	2	12	$ 100	$ 57,600	2
12 Monthly	Mechanical Trades	24	4	12	$ 100	$ 115,200	1
Crusher							
Monthly	Mechanical Trades	12	2	12	$ 100	$ 345,600	12
TOTAL		48	26			$ 518,400	
					Unit Cost AUD$/t	$ 0.26	

Position	Number	Salary each (AUD$)	Total (AUD$)	On Cost factor	Total Cost (AUD$)	Roster on:off
Boilermaker Welder	3	$ 110,000	$ 330,000	1.25	$ 412,500	2:1
Apprentice Boilermaker	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Electrical Maintenance Supervisor	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Electrician/Instrument Technician	3	$ 130,000	$ 390,000	1.25	$ 487,500	2:1
Apprentice Electrician	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Trades Assistants	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Sub-total	20		$ 2,430,000		$ 3,037,500	
Admin						
General Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Commercial Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
OHS and Enviromental Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
Enviromental Superintendent	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Accountant	1	$ 110,000	$ 110,000	1.25	$ 137,500	0:00
OHS Officer	2	$ 110,000	$ 220,000	1.25	$ 275,000	0:00
Enviromental Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Storeman	3	$ 100,000	$ 300,000	1.25	$ 375,000	0:00
Admin	2	$ 80,000	$ 160,000	1.25	$ 200,000	0:00
Training Coordinator	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Purchasing Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	0:00
Sub-total	18		$ 2,090,000		$ 2,612,500	
TOTAL	69		$ 6,110,000		$ 10,250,000	
				Unit cost AUD$/t	$ 5.13	

Notes:
1. All shift personnel working 12 hour shifts
2. All Personnel FIFO
3. On cost factor includes superannuation, payroll tax and workers compensation insurance
4. Shift operators are as follows: control room (1), crushing and grinding (1), flotation (0), CIL(1), reagents and dewatering (1), elution and goldroom (1).
5. Shift operators are allocated as follows: process technicians (20), shift supervisors (3) and ROM loader operator (4)
6. No accommodation or flight costs are included

Plant throughput 2,000,000 tpa

MAINTENANCE COST SUMMARY

Area	Capital Cost (Supply) AUD$	Maintenance Consumables Factor (%)	Maintenance Consumables Cost (AUD$/year)	% Fixed	Maintenance Cost Fixed (AUD$/year)
Plant Maintenance					
CRUSHING	$ 2,823,931	6.0%	$ 169,436	40%	$ 67,774
COARSE ORE STORAGE AND RECLAIM	$ 1,946,191	6.0%	$ 116,771	40%	$ 46,709
GRINDING AND CLASSIFICATION	$ 7,959,588	6.0%	$ 477,575	40%	$ 191,030
GRAVITY	$ 745,775	6.0%	$ 44,746	40%	$ 17,899
FLOTATION	$ -	6.0%	$ -	40%	$ -
FINE GRIND AND CLASSIFICATION	$ -	6.0%	$ -	40%	$ -
CYANIDATION	$ 4,479,108	6.0%	$ 268,746	40%	$ 107,499
GOLD RECOVERY	$ 732,304	6.0%	$ 43,938	40%	$ 17,575
CARBON REGENERATION	$ 205,946	3.0%	$ 6,178	40%	$ 2,471
TAILINGS	$ 2,600,772	3.0%	$ 78,023	40%	$ 31,209
FLOTATION CONC THICKENER	$ -	3.0%	$ -	40%	$ -
CONC FILTER	$ -	3.0%	$ -	40%	$ -
REAGENTS- MIXING AND DISTRIBUTION	$ 1,058,449	3.0%	$ 31,753	40%	$ 12,701
SITE SERVICES	$ 919,374	3.0%	$ 27,581	40%	$ 11,032
OXYGEN PLANT	$ 600,000	3.0%	$ 18,000	40%	$ 7,200
			$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
Mobile Equipment			$ -	80%	$ -
Maintenance General					
Maintenance software			$ 100,000	100%	$ 100,000
Maintenance manuals			$ 100,000	100%	$ 100,000
Maintenance training			$ 100,000	100%	$ 100,000
Contract Labour					
Hire equipment service agreements			$ -	100%	$ -
SAG Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
Ball Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
TOTAL			$ 1,582,750		$ 813,100

NOTES:

1. Mobile equipment maintenance excluded
2. Maintenance Cost Estimate based on Capital Cost Estimate

strategic METALLURGY

Plant throughput 2,000,000 tpa

LABORATORY COST SUMMARY

Shifts per day 2

Assay Requirement	Shift	Daily	Weekly	Monthly	Total Assays	Outside %	Internal %	External AUD$/sample	Internal AUD$/sample	External AUD$/y	Internal AUD$/y	TOTAL AUD$/y
Solids Assays												
Mill Feed - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Flotation feed-Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Rougher Concentrate - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Scavenger Tailings - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Cleaner Tailings - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Cleaner Concentrate - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
POX feed - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Feed - Au, S, S2-	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Metallurgical Testing (flotation)- Ni, Cu, Fe, Mg				10	2,400	50%	50%	$ 60	$ 100	$ 75,000	$ 60,000	$ 135,000
Solution Assays												
ILR PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Neutralisation Feed		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Neutralisation Tails		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Tk 1- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Adsorbance Tk 1- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au, Free CN, WAD CN	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Elution PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Elution BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Carbon Assays												
Adsorbance Tk 1- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
Loaded Carbon- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
Barren Carbon- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
GIC- Solid Assays												
Concentrate Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut filter feed tank- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 1 - Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Solutions												
Leach Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Carbon												
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Miscellaneous												
Mill Feed Moisture	1				730	0%	100%	$ 20	$ 8	$ -	$ 5,475	$ 5,475
Flotation Concentrate Sizing	1		1	1	794	0%	100%	$ 30	$ 8	$ -	$ 5,955	$ 5,955
Environmental Samples			5	10	380	0%	100%	$ 30	$ 10	$ -	$ 3,800	$ 3,800
Water Quality Samples			2	2	128	0%	100%	$ 30	$ 10	$ -	$ 1,280	$ 1,280
Sulphur assays	6				4,380	0%	100%	$ 30	$ 15	$ -	$ 65,700	$ 65,700
Metallurgical Testing				10	120	50%	50%	$ 1,000	$ 1,000	$ 60,000	$ 60,000	$ 120,000
Mine Grade Control												
Grade Control		50			18,250	0%	100%	$ 30	$ 15	$ -	$273,750	$ 273,750
Subtotal					54,697					$135,000	$751,110	$ 886,110
Replacement Glassware												$ 45,000
Miscellaneous												$ 50,000
TOTAL												$ 981,110

NOTES:

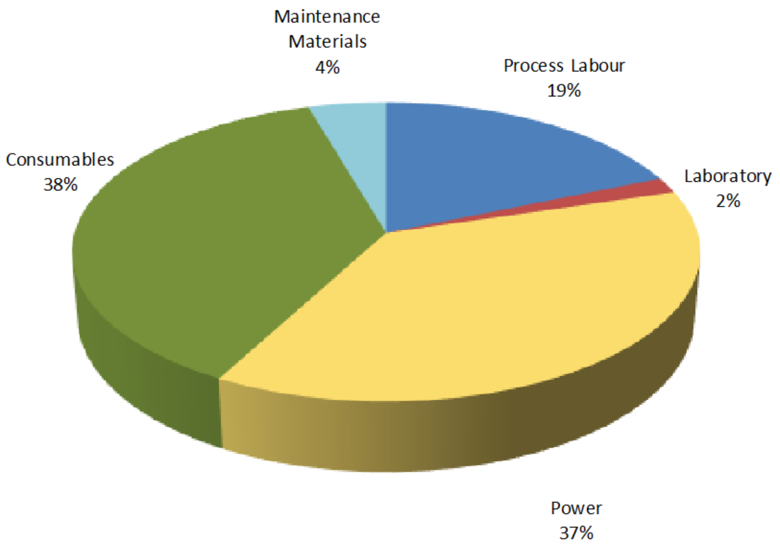
1. Grade Control Sampling Cost excluded

Project: Minyari Dome Gold Project
Client: Antipa
Description: High-level cost estimation
Rev: DRAFT

Plant throughput 3,000,000 tpa

OPERATING COST SUMMARY

	Total Cost		% Fixed	Fixed		% Variable	Variable	
	AUD$/yr	AUD$/t		AUD$/yr	AUD$/t		AUD$/yr	AUD$/t
Operating Consumables	$ 21,655,949	$ 7.22	0%	$ -	$ -	100%	$ 21,655,949	$ 7.22
Process Labour	$ 10,768,400	$ 3.59	100%	$ 10,768,400	$ 3.59	0%	$ -	$ -
Power	$ 21,622,449	$ 7.21	30%	$ 6,477,725	$ 2.16	70%	$ 15,144,724	$ 5.05
Laboratory	$ 981,110	$ 0.33	80%	$ 784,888	$ 0.26	20%	$ 196,222	$ 0.07
Maintenance Materials	$ 2,613,138	$ 0.87	33%	$ 875,182	$ 0.29	67%	$ 1,737,956	$ 0.58
TOTAL PROCESSING COST	$ 57,641,046	$ 19.21	33%	$ 18,906,195	$ 6.30	67%	$ 38,734,851	$ 12.91



8.10 Detailed operating cost – Case 1: 3Mtpa

Plant throughput 3,000,000 tpa

PROCESS CONSUMABLES COST SUMMARY

Operating Consumable	Consumable	Consumption rate (Unit/measure)	Annual consumption (Unit/annum)	UOM	Delivery size	Consumable item direct costs: Supplied Cost AUD$/unit	Transport AUD$/unit	Cost to site AUD$/unit	Total Cost AUD$/unit	Totals: Consumable cost $/annum	Supplier
Crushing											
Primary Crusher	*Complete*	4.1 set(s)/y	4.1 set(s)/y	set	1	$ 25,000	$ 2,500	$ 27,500	$ 27,500	$ 112,420	Metso
Grinding									$ -		
SAG Mill	*Wear Liners*	1.5 set(s)/y	1.5 set(s)/y	set	1	$ 1,000,000	$ 10,000	$ 1,010,000	$ 1,010,000	$ 1,515,000	Warman
	Grinding Media	0.210 kg/t	630tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ 1,134,000	Orica
Ball Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 600,000	$ 10,000	$ 610,000	$ 610,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Ball Mill- Limestone	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 400,000	$ 10,000	$ 410,000	$ 410,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Tower Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 100,000	$ 10,000	$ 110,000	$ 110,000	$ -	
	Impeller consumables			lot				$ -	$ -	$ -	
	Grinding Media	0.000 kg/t	0tpa	t	5	$ 2,500	$ 300	$ 2,800	$ 2,800	$ -	Metso
Pebble Crusher	*Mantle/Concave Set*	4.0 set(s)/y	4.0 set(s)/y	set	1	$ 50,000	$ 2,500	$ 52,500	$ 52,500	$ 210,000	Metso
Concentrate Filtration											
Filter Components	*Cloths*		0 cloths/y	set	60	$ 208	$ 8	$ 216	$ 216	$ -	
Filter Components	*Plates*		0.0 set(s)/y	set		$ 10,000	$ 500	$ 10,500	$ 10,500	$ -	Metso
Reagents									$ -		
Potassium Amyl Xanthate	*Flotation*	0.00 kg/t	0tpa	t	20	$ 2,400	$ 300	$ 2,700	$ 2,700	$ -	Orica
Frother	*Flotation*	0.00 kg/t	0tpa	t	20	$ 4,700	$ 300	$ 5,000	$ 5,000	$ -	Orica
Copper sulphate	*Flotation/ Cyanide Destruct*	0.00 kg/t	0tpa	t	20	$ 3,090	$ 300	$ 3,390	$ 3,390	$ -	Database
Quicklime	*Flotation/ Cyanidation*	1.20 kg/t	3,600tpa	t	20			$ 290	$ 290	$ 1,044,000	Cockburn Cement
Limestone	*Neutralisation*		0tpa	t	27			$ 120	$ 120	$ -	WA Limestone
Sulfuric acid	*POX*	0.00 kg/t	0tpa	t	20			$ 90	$ 90	$ -	Database
Oxygen	*POX/ Cyanidation*		0tpa	t							BOC
Sodium Cyanide	*Cyanidation*	1.07 kg/t	3,210tpa	t	20			$ 3,000	$ 3,000	$ 9,630,000	CSBP
Activated Carbon	*Cyanidation*	0.03 kg/t	78tpa	t	20	$ 2,455	$ 300	$ 2,755	$ 2,755	$ 214,890	Haycarb
Sodium Hydroxide	*Elution*	0.22 kg/t	660tpa	t	20	$ 320	$ 160	$ 480	$ 480	$ 316,800	Coogee Chemicals
Hydrochloric acid	*Elution*	0.13 kg/t	400tpa	t	20			$ 610	$ 610	$ 244,000	Coogee Chemicals
Hydrogen peroxide	*Cyanide Destruct*	1.31 kg/t	3,921tpa	t	20			$ 1,247	$ 1,247	$ 4,889,839	Evonik
Lead Nitrate	*Pyrite leach*		0tpa	t		$ 2,620	$ 300	$ 2,920	$ 2,920	$ -	Esease
Flocculant	*Thickening*	0.10 kg/t	0tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 1,170,000	Ciba
Water Treatment and Cleaning											
Water Treatment	*Potable Water*	100,000 kL/yr	100,000 kL/yr	kL					$ 0	$ 15,000	TBA
Antiscalant	*Decant Return Water*	18,000 L/yr	18,000 L/yr	t	TBA	$ 2,500	$ -	$ 2,500	$ 2,500	$ 45,000	TBA
Antiscalant	*Raw water*	12,000 L/yr	12,000 L/yr	t	TBA	$ 4,100	$ -	$ 4,100	$ 4,100	$ 49,200	TBA
Cooling Tower dosing pack	*Allowance*			lot						$ -	
Sulphamic Acid	*Cleaning*	0 kg/yr	0 kg/yr	t	TBA	$ 1,880	$ -	$ 1,880	$ 1,880	$ -	TBA
General											
Mill Lubricants	*Allowance*	$ 150,000	$ 150,000	lot		$ 150,000	$ 2,500	$ 152,500	$ 152,500	$ 152,500	TBA
Cyclone spares	*Allowance*	$ 30,000	$ 30,000	lot		$ 30,000	$ 1,000	$ 31,000	$ 31,000	$ 31,000	TBA
Mobile and hire equipment	*Allowance*	$ 300,000	$ 300,000	lot		$ 300,000		$ 300,000	$ 300,000	$ 300,000	TBA
General Supplies	*Allowance*	$ 50,000	$ 50,000	lot		$ 50,000	$ 1,000	$ 51,000	$ 51,000	$ 51,000	TBA
Operator Consumables	*Allowance*	$ 7,600	$ 7,600	person		$ 7,600	$ 100	$ 7,700	$ 7,700	$ 531,300	TBA
TOTAL CONSUMABLE COST										$ 21,655,949	

Notes:

1.) Excludes Mining Cost

2.) Transport cost allowance of $300 per tonne

3.) Assume municipal water supply for potable water, no cost

Plant throughput 3,000,000 tpa

POWER COST SUMMARY

Area	Power		Consumption		Cost	
	Installed	Average Continuous Draw	Annual	Rate	Annual	Rate
	(kW)	(kW)	(kW)	(kWh/t)	(AUD$)	AUD$/t
Crushing	720	353	3,090,528	1.03	$ 934,182	$ 0.31
Coarse Ore Storage	144	92	806,400	0.27	$ 243,753	$ 0.08
Grinding & Classification	6987	5790	50,718,093	16.91	$ 15,330,696	$ 5.11
Flotation	0	0	-	0.00	$ -	$ -
Flotation Tails Thickener and Process Water Recovery	0	0	-	0.00	$ -	$ -
Fine Grinding	0	0	-	0.00	$ -	$ -
Cyanidation	1288	1004	8,796,693	2.93	$ 2,659,000	$ 0.89
Cyanidation Tailings Thickening and Process Water Recovery	225	66	575,867	0.19	$ 174,069	$ 0.06
Elution and Goldroom	60	42	370,728	0.12	$ 112,061	$ 0.04
Carbon Regeneration	70	26	224,000	0.07	$ 67,709	$ 0.02
Reagents Area	454	216	1,892,880	0.63	$ 572,166	$ 0.19
Water Services Total	645	283	2,479,200	0.83	$ 749,395	$ 0.25
Air Services Total	409	150	1,309,855	0.44	$ 395,933	$ 0.13
Oxygen Plant	151	127	1,111,360	0.37	$ 335,934	$ 0.11
Administration, Workshop and Store Total	10	7	57,956	0.02	$ 17,519	$ 0.11
Laboratory Total	18	11	99,353	0.03	$ 30,032	$ 0.01
TOTAL	11,181	8,166	71,532,913	23.84	$ 21,622,449	$ 7.31

LABOUR COST (CONTRACT MAINTENANCE)

Title	Category	Number	Days	Hours/Day	Rate (AUD$/h)	Total Cost (AUD$)	Roster /year
General							
Monthly	Mechanical Trades	0	3	12	$ 100	$ -	12
	Electrical Trades	0	3	12	$ 120	$ -	12
3 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	4
	Electrical Trades	0	3	12	$ 120	$ -	4
6 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	2
	Electrical Trades	0	3	12	$ 120	$ -	2
Mill Relines							
6 Monthly	Mechanical Trades	12	2	12	$ 100	$ 57,600	2
12 Monthly	Mechanical Trades	24	4	12	$ 100	$ 115,200	1
Crusher							
Monthly	Mechanical Trades	12	2	12	$ 100	$ 345,600	12
TOTAL		48	26			$ 518,400	
					Unit Cost AUD$/t	$ 0.17	

Plant throughhp 3,000,000 tpa

LABOUR COST SUMMARY (STAFF)

Position	Number	Salary each (AUD$)	Total (AUD$)	On Cost factor	Total Cost (AUD$)	Roster on:off
Production						
Processing Plant Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Production Supernintendent	1	$ 200,000	$ 200,000	1.25	$ 250,000	2:1
Production Co-ordinator	2	$ 180,000	$ 360,000	1.25	$ 450,000	2:1
Senior Metallurgist	1	$ 150,000	$ 150,000	1.25	$ 187,500	2:1
Metallurgist	2	$ 130,000	$ 260,000	1.25	$ 325,000	2:1
Laboratory Manager	0	$ 130,000	$ -	1.25	$ -	2:1
Laboratory Technicians		$ 100,000	$ -	1.25	$ -	2:1
Shift Supervisor	3	$ 115,000	$ 345,000	1.25	$ 431,250	2:1
Process Technician (shift)	15	$ 100,000	$ 1,500,000	1.25	$ 1,875,000	2:1
Process Technician (day)	3	$ 100,000	$ 300,000	1.25	$ 375,000	2:1
ROM Loader Operater	3	$ 105,000	$ 315,000	1.25	$ 393,750	2:1
Sub-total	31		$ 3,680,000		$ 4,600,000	
Maintenance						
Maintenance Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Maintenance Superintendent	1	$ 180,000	$ 180,000	1.25	$ 225,000	2:1
Maintenance Planner	1	$ 150,000	$ 150,000	1.25	$ 187,500	2:1
Mechanical Maintenance Superviso	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Maintenance Leading Hand	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Mechanical Fitter	3	$ 110,000	$ 330,000	1.25	$ 412,500	2:1
Apprentice Fitter	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Boilermaker Welder	3	$ 110,000	$ 330,000	1.25	$ 412,500	2:1
Apprentice Boilermaker	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Electrical Maintenance Supervisor	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Electrician/Instrument Technician	3	$ 130,000	$ 390,000	1.25	$ 487,500	2:1
Apprentice Electrician	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Trades Assistants	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Sub-total	20		$ 2,430,000		$ 3,037,500	
Admin						
General Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Commercial Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
OHS and Enviromental Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
Enviromental Superintendent	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Accountant	1	$ 110,000	$ 110,000	1.25	$ 137,500	0:00
OHS Officer	2	$ 110,000	$ 220,000	1.25	$ 275,000	0:00
Enviromental Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Storeman	3	$ 100,000	$ 300,000	1.25	$ 375,000	0:00
Admin	2	$ 80,000	$ 160,000	1.25	$ 200,000	0:00
Training Coordinator	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Purchasing Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	0:00
Sub-total	18		$ 2,090,000		$ 2,612,500	
TOTAL	69		$ 6,110,000		$ 10,250,000	
				Unit cost AUD$/t	$ 3.42	

Notes:
1. All shift personnel working 12 hour shifts
2. All Personnel FIFO
3. On cost factor includes superannuation, payroll tax and workers compensation insurance
4. Shift operators are as follows: control room (1), crushing and grinding (1), flotation (0), CIL(1), reagents and dewatering (1), elution and goldroom (1).
5. Shift operators are allocated as follows: process technicians (20), shift supervisors (3) and ROM loader operator (4)
6. No accommodation or flight costs are included

Plant throughput 3,000,000 tpa

MAINTENANCE COST SUMMARY

Area	Capital Cost (Supply) AUD$	Maintenance Consumables Factor (%)	Maintenance Consumables Cost (AUD$/year)	% Fixed	Maintenance Cost Fixed (AUD$/year)
Plant Maintenance					
CRUSHING	$ 3,150,380	6.0%	$ 189,023	40%	$ 75,609
COARSE ORE STORAGE AND RECLAIM	$ 2,171,172	6.0%	$ 130,270	40%	$ 52,108
GRINDING AND CLASSIFICATION	$ 8,879,721	6.0%	$ 532,783	40%	$ 213,113
GRAVITY	$ 831,987	6.0%	$ 49,919	40%	$ 19,968
FLOTATION	$ -	6.0%	$ -	40%	$ -
FINE GRIND AND CLASSIFICATION	$ -	6.0%	$ -	40%	$ -
CYANIDATION	$ 4,996,896	6.0%	$ 299,814	40%	$ 119,925
GOLD RECOVERY	$ 816,959	6.0%	$ 49,018	40%	$ 19,607
CARBON REGENERATION	$ 229,753	3.0%	$ 6,893	40%	$ 2,757
TAILINGS	$ 2,901,423	3.0%	$ 87,043	40%	$ 34,817
FLOTATION CONC THICKENER	$ -	3.0%	$ -	40%	$ -
CONC FILTER	$ -	3.0%	$ -	40%	$ -
REAGENTS- MIXING AND DISTRIBUTION	$ 1,180,806	3.0%	$ 35,424	40%	$ 14,170
SITE SERVICES	$ 1,025,654	3.0%	$ 30,770	40%	$ 12,308
OXYGEN PLANT	$ 900,000	3.0%	$ 27,000	40%	$ 10,800
			$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
Mobile Equipment			$ -	80%	$ -
Maintenance General					
Maintenance software			$ 100,000	100%	$ 100,000
Maintenance manuals			$ 100,000	100%	$ 100,000
Maintenance training			$ 100,000	100%	$ 100,000
Contract Labour					
Hire equipment service agreements			$ -	100%	$ -
SAG Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
Ball Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
TOTAL			$ 1,737,956		$ 875,182

NOTES:

1. Mobile equipment maintenance excluded
2. Maintenance Cost Estimate based on Capital Cost Estimate

Plant throughput 3,000,000 tpa

LABORATORY COST SUMMARY

Shifts per day 2

Assay Requirement	Shift	Daily	Weekly	Monthly	Total Assays	Outside %	Internal %	External AUD$/sample	Internal AUD$/sample	External AUD$/y	Internal AUD$/y	TOTAL AUD$/y
Solids Assays												
Mill Feed - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Flotation feed-Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Rougher Concentrate - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Scavenger Tailings - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Cleaner Tailings - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Cleaner Concentrate - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
POX feed - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Feed - Au, S, S2-	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Metallurgical Testing (flotation)- Ni, Cu, Fe, Mg				10	2,400	50%	50%	$ 60	$ 100	$ 75,000	$ 60,000	$ 135,000
Solution Assays												
ILR PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Neutralisation Feed		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Neutralisation Tails		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Tk 1- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Adsorbance Tk 1- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au, Free CN, WAD CN	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Elution PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Elution BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Carbon Assays												
Adsorbance Tk 1- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
Loaded Carbon- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
Barren Carbon- Au	1	1			1,095	0%	100%	$ 30	$ 10	$ -	$ 10,950	$ 10,950
GIC- Solid Assays												
Concentrate Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut filter feed tank- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 1 - Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Solutions												
Leach Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Carbon												
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Miscellaneous												
Mill Feed Moisture	1				730	0%	100%	$ 20	$ 8	$ -	$ 5,475	$ 5,475
Flotation Concentrate Sizing	1		1	1	794	0%	100%	$ 30	$ 8	$ -	$ 5,955	$ 5,955
Environmental Samples			5	10	380	0%	100%	$ 30	$ 10	$ -	$ 3,800	$ 3,800
Water Quality Samples			2	2	128	0%	100%	$ 30	$ 10	$ -	$ 1,280	$ 1,280
Sulphur assays	6				4,380	0%	100%	$ 30	$ 15	$ -	$ 65,700	$ 65,700
Metallurgical Testing				10	120	50%	50%	$ 1,000	$ 1,000	$ 60,000	$ 60,000	$ 120,000
Mine Grade Control												
Grade Control		50			18,250	0%	100%	$ 30	$ 15	$ -	$273,750	$ 273,750
Subtotal					54,697					$135,000	$751,110	$ 886,110
Replacement Glassware												$ 45,000
Miscellaneous												$ 50,000
TOTAL												$ 981,110

NOTES:

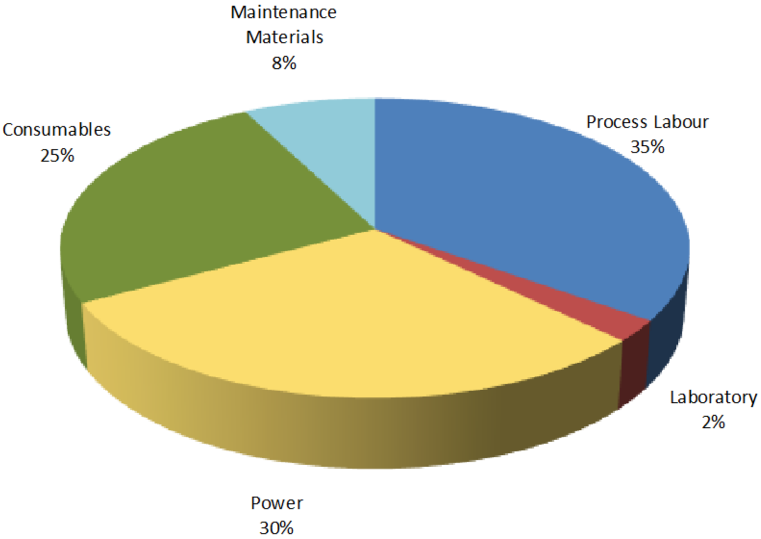
1. Grade Control Sampling Cost excluded

Project: Minyari Dome Gold Project
Client: Antipa
Description: High-level cost estimation
Rev: DRAFT

Plant throughput 1,000,000 tpa

OPERATING COST SUMMARY

	Total Cost		% Fixed	Fixed		% Variable	Variable	
	AUD$/yr	AUD$/t		AUD$/yr	AUD$/t		AUD$/yr	AUD$/t
Operating Consumables	$ 9,569,280	$ 9.57	0%	$ -	$ -	100%	$ 9,569,280	$ 9.57
Process Labour	$ 13,224,650	$ 13.22	100%	$ 13,224,650	$ 13.22	0%	$ -	$ -
Power	$ 11,418,482	$ 11.42	30%	$ 3,416,535	$ 3.42	70%	$ 8,001,947	$ 8.00
Laboratory	$ 896,970	$ 0.90	80%	$ 717,576	$ 0.72	20%	$ 179,394	$ 0.18
Maintenance Materials	$ 2,920,448	$ 2.92	33%	$ 962,985	$ 0.96	67%	$ 1,957,463	$ 1.96
TOTAL PROCESSING COST	$ 38,029,830	$ 38.03	48%	$ 18,321,746	$ 18.32	52%	$ 19,708,084	$ 19.71



8.11 Detailed operating cost – Case 2: 1Mtpa

Plant throughput 1,000,000 tpa

PROCESS CONSUMABLES COST SUMMARY

Operating Consumable	Consumable	Consumption rate (Unit/measure)	Annual consumption (Unit/annum)	UOM	Delivery size	Consumable item direct costs: Supplied Cost AUD$/unit	Transport AUD$/unit	Cost to site AUD$/unit	Total Cost AUD$/unit	Totals: Consumable cost $/annum	Supplier
Crushing											
Primary Crusher	*Complete*	4.1 set(s)/y	4.1 set(s)/y	set	1	$ 25,000	$ 2,500	$ 27,500	$ 27,500	$ 112,420	Metso
Grinding									$ -		
SAG Mill	*Wear Liners*	1.5 set(s)/y	1.5 set(s)/y	set	1	$ 1,000,000	$ 10,000	$ 1,010,000	$ 1,010,000	$ 1,515,000	Warman
	Grinding Media	0.210 kg/t	210tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ 378,000	Orica
Ball Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 600,000	$ 10,000	$ 610,000	$ 610,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Ball Mill- Limestone	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 400,000	$ 10,000	$ 410,000	$ 410,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Tower Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 100,000	$ 10,000	$ 110,000	$ 110,000	$ -	
	Impeller consumables			lot				$ -	$ -	$ -	
	Grinding Media	0.000 kg/t	0tpa	t	5	$ 2,500	$ 300	$ 2,800	$ 2,800	$ -	Metso
Pebble Crusher	*Mantle/Concave Set*	4.0 set(s)/y	4.0 set(s)/y	set	1	$ 50,000	$ 2,500	$ 52,500	$ 52,500	$ 210,000	Metso
Concentrate Filtration											
Filter Components	*Cloths*	30 cloths/qtr	120 cloths/y	set	60	$ 208	$ 8	$ 216	$ 216	$ 25,860	
Filter Components	*Plates*	10.0 set(s)/y	10.0 set(s)/y	set		$ 10,000	$ 500	$ 10,500	$ 10,500	$ 105,000	Metso
Reagents									$ -		
Potassium Amyl Xanthate	*Flotation*	0.20 kg/t	200tpa	t	20	$ 2,800	$ 300	$ 3,100	$ 3,100	$ 620,000	Orica
Frother	*Flotation*	0.05 kg/t	50tpa	t	20	$ 4,700	$ 300	$ 5,000	$ 5,000	$ 250,000	Orica
Copper sulphate	*Flotation*	0.10 kg/t	100tpa	t	20	$ 3,900	$ 300	$ 4,200	$ 4,200	$ 420,000	Database
Quicklime	*Flotation*	0.75 kg/t	750tpa	t	20			$ 290	$ 290	$ 217,500	Cockburn Cement
Dithiophosphine	*Flotation*	0.02 kg/t	20tpa	t	27	$ 15,000	$ 300	$ 15,300	$ 15,300	$ 306,000	WA Limestone
Sulfuric acid	*Flotation*	12.0 kg/t	12,000tpa	t	20			$ 150	$ 150	$ 1,800,000	Database
Sodium silicate	*Flotation*	0.20 kg/t	200tpa	t		$ 1,200	$ 300	$ 1,500		$ 300,000	BASF
Sodium Sulfite	*Flotation*	0.40 kg/t	400tpa	t	20	$ 720		$ 3,000	$ 3,000	$ 1,200,000	Database
Triethylene tetraamine	*Flotation*	0.10 kg/t	100tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 390,000	Database
Sodium Hydroxide	*Elution*	0.00 kg/t	0.0tpa	t	20	$ 320	$ 160	$ 480	$ 480	$ -	Coogee Chemicals
Hydrochloric acid	*Elution*	0.00 kg/t	0.0tpa	t	20			$ 610	$ 610	$ -	Coogee Chemicals
Hydrogen peroxide	*Cyanide Destruct*	0.00 kg/t	0.0tpa	t	20			$ 1,247	$ 1,247	$ -	Evonik
Lead Nitrate	*Pyrite leach*		0.0tpa	t		$ 2,620	$ 300	$ 2,920	$ 2,920	$ -	Esease
Flocculant	*Thickening*	0.11 kg/t	110.0tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 429,000	Ciba
Water Treatment and Cleaning											
Water Treatment	*Potable Water*	100,000 kL/yr	100,000 kL/yr	kL					$ 0	$ 15,000	TBA
Antiscalant	*Decant Return Water*	18,000 L/yr	18,000 L/yr	t	TBA	$ 2,500	$ -	$ 2,500	$ 2,500	$ 45,000	TBA
Antiscalant	*Raw water*	12,000 L/yr	12,000 L/yr	t	TBA	$ 4,100	$ -	$ 4,100	$ 4,100	$ 49,200	TBA
Cooling Tower dosing pack	*Allowance*			lot						$ -	
Sulphamic Acid	*Cleaning*	0 kg/yr	0 kg/yr	t	TBA	$ 1,880	$ -	$ 1,880	$ 1,880	$ -	TBA
General											
Mill Lubricants	*Allowance*	$ 150,000	$ 150,000	lot		$ 150,000	$ 2,500	$ 152,500	$ 152,500	$ 152,500	TBA
Cyclone spares	*Allowance*	$ 30,000	$ 30,000	lot		$ 30,000	$ 1,000	$ 31,000	$ 31,000	$ 31,000	TBA
Mobile and hire equipment	*Allowance*	$ 300,000	$ 300,000	lot		$ 300,000		$ 300,000	$ 300,000	$ 300,000	TBA
General Supplies	*Allowance*	$ 50,000	$ 50,000	lot		$ 50,000	$ 1,000	$ 51,000	$ 51,000	$ 51,000	TBA
Operator Consumables	*Allowance*	$ 7,600	$ 7,600	person		$ 7,600	$ 100	$ 7,700	$ 7,700	$ 646,800	TBA
TOTAL CONSUMABLE COST										$ 9,569,280	

Notes:

1.) Excludes Mining Cost

2.) Transport cost allowance of $300 per tonne

3.) Assume municipal water supply for potable water, no cost

strategic METALLURGY

Plant throughput 1,000,000 tpa

POWER COST SUMMARY

Area	Power		Consumption		Cost	
	Installed	Average Continuous Draw	Annual	Rate	Annual	Rate
	(kW)	(kW)	(kW)	(kWh/t)	(AUD$)	AUD$/t
Crushing	550	270	2,360,820	2.36	$ 713,612	$ 0.71
Coarse Ore Storage	96	61	537,600	0.54	$ 162,502	$ 0.16
Grinding & Classification	2427	1976	17,309,391	17.31	$ 5,232,157	$ 5.23
Flotation	1188	839	7,352,197	7.35	$ 2,222,369	$ 2.22
Flotation Tails Thickener and Process Water Recovery	139	62	546,055	0.55	$ 165,057	$ 0.17
Fine Grinding	420	323	2,832,628	2.83	$ 856,226	$ 0.86
Cyanidation	0	0	-	0.00	$ -	$ -
Cyanidation Tailings Thickening and Process Water Recovery	0	0	-	0.00	$ -	$ -
Elution and Goldroom	0	0	-	0.00	$ -	$ -
Carbon Regeneration	0	0	-	0.00	$ -	$ -
Reagents Area	205	93	811,430	0.81	$ 245,273	$ 0.25
Water Services Total	345	148	1,298,400	1.30	$ 392,471	$ 0.39
Air Services Total	916	522	4,569,600	4.57	$ 1,381,265	$ 1.38
Oxygen Plant	0	0	-	0.00	$ -	$ -
Administration, Workshop and Store Total	10	7	57,956	0.06	$ 17,519	$ -
Laboratory Total	18	11	99,353	0.10	$ 30,032	$ 0.03
TOTAL	6,313	4,312	37,775,431	37.78	$ 11,418,482	$ 11.40

LABOUR COST (CONTRACT MAINTENANCE)

Title	Category	Number	Days	Hours/Day	Rate (AUD$/h)	Total Cost (AUD$)	Roster /year
General							
Monthly	Mechanical Trades	0	3	12	$ 100	$ -	12
	Electrical Trades	0	3	12	$ 120	$ -	12
3 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	4
	Electrical Trades	0	3	12	$ 120	$ -	4
6 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	2
	Electrical Trades	0	3	12	$ 120	$ -	2
Mill Relines							
6 Monthly	Mechanical Trades	12	2	12	$ 100	$ 57,600	2
12 Monthly	Mechanical Trades	24	4	12	$ 100	$ 115,200	1
Crusher							
Monthly	Mechanical Trades	12	2	12	$ 100	$ 345,600	12
TOTAL		48	26			$ 518,400	
					Unit Cost AUD$/t	$ 0.52	

Plant throughput 1,000,000 tpa

LABOUR COST SUMMARY (STAFF)

Position	Number	Salary each (AUD$)	Total (AUD$)	On Cost factor	Total Cost (AUD$)	Roster on:off
Production						
Processing Plant Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Production Superintendent	1	$ 200,000	$ 200,000	1.25	$ 250,000	2:1
Production Co-ordinator	2	$ 180,000	$ 360,000	1.25	$ 450,000	2:1
Senior Metallurgist	1	$ 160,000	$ 160,000	1.25	$ 200,000	2:1
Metallurgist	2	$ 130,000	$ 260,000	1.25	$ 325,000	2:1
Laboratory Manager	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Laboratory Technicians	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Shift Supervisor	3	$ 140,000	$ 420,000	1.25	$ 525,000	2:1
Process Technician (shift)	18	$ 115,000	$ 2,070,000	1.25	$ 2,587,500	2:1
Process Technician (day)	3	$ 100,000	$ 300,000	1.25	$ 375,000	2:1
ROM Loader Operater	3	$ 105,000	$ 315,000	1.25	$ 393,750	2:1
Sub-total	37		$ 4,665,000		$ 5,831,250	
Maintenance						
Maintenance Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Maintenance Superintendent	1	$ 180,000	$ 180,000	1.25	$ 225,000	2:1
Maintenance Planner	1	$ 150,000	$ 150,000	1.25	$ 187,500	2:1
Mechanical Maintenance Supervisor	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Maintenance Leading Hand	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Mechanical Fitter	5	$ 110,000	$ 550,000	1.25	$ 687,500	2:1
Apprentice Fitter	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Boilermaker Welder	5	$ 110,000	$ 550,000	1.25	$ 687,500	2:1
Apprentice Boilermaker	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Electrical Maintenance Supervisor	2	$ 150,000	$ 300,000	1.25	$ 375,000	2:1
Electrician/Instrument Technician	4	$ 130,000	$ 520,000	1.25	$ 650,000	2:1
Apprentice Electrician	2	$ 80,000	$ 160,000	1.25	$ 200,000	2:1
Trades Assistants	3	$ 80,000	$ 240,000	1.25	$ 300,000	2:1
Sub-total	29		$ 3,410,000		$ 4,262,500	
Admin						
General Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Commercial Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
OHS and Enviromental Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
Enviromental Supernintendent	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Accountant	1	$ 110,000	$ 110,000	1.25	$ 137,500	0:00
OHS Officer	2	$ 110,000	$ 220,000	1.25	$ 275,000	0:00
Enviromental Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Storeman	3	$ 100,000	$ 300,000	1.25	$ 375,000	0:00
Admin	2	$ 80,000	$ 160,000	1.25	$ 200,000	0:00
Training Coordinator	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Purchasing Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	0:00
Sub-total	18		$ 2,090,000		$ 2,612,500	
TOTAL	84		$ 8,075,000		$ 12,706,250	
				Unit cost AUD$/t	$ 12.71	

Notes:
1. All shift personnel working 12 hour shifts
2. All Personnel FIFO
3. On cost factor includes superannuation, payroll tax and workers compensation insurance
4. Shift operators are as follows: control room (1), crushing and grinding (1), flotation (1), CIL(0), reagents and dewatering (1), elution and goldroom (0), Filters (1), concentrate loadout (1).
5. Shift operators are allocated as follows: process technicians (20), shift supervisors (3) and ROM loader operator (4)
6. No accommodation or flight costs are included

Plant throughput 1,000,000 tpa

MAINTENANCE COST SUMMARY

Area	Capital Cost (Supply) AUD$	Maintenance Consumables Factor (%)	Maintenance Consumables Cost (AUD$/year)	% Fixed	Maintenance Cost Fixed (AUD$/year)
Plant Maintenance					
CRUSHING	$ 1,219,245	6.0%	$ 73,155	40%	$ 29,262
COARSE ORE STORAGE AND RECLAIM	$ 840,276	6.0%	$ 50,417	40%	$ 20,167
GRINDING AND CLASSIFICATION	$ 5,848,755	6.0%	$ 350,925	40%	$ 140,370
GRAVITY	$ 548,000	6.0%	$ 32,880	40%	$ 13,152
FLOTATION	$ 6,848,093	6.0%	$ 410,886	40%	$ 164,354
FINE GRIND AND CLASSIFICATION	$ 1,529,855	12.0%	$ 183,583	40%	$ 73,433
CYANIDATION	$ -	6.0%	$ -	40%	$ -
GOLD RECOVERY	$ -	6.0%	$ -	40%	$ -
CARBON REGENERATION	$ -	3.0%	$ -	40%	$ -
TAILINGS	$ 1,715,870	3.0%	$ 51,476	40%	$ 20,590
FLOTATION CONC THICKENER	$ 341,770	3.0%	$ 10,253	40%	$ 4,101
CONC FILTER	$ 3,192,567	12.0%	$ 383,108	40%	$ 153,243
REAGENTS- MIXING AND DISTRIBUTION	$ 1,106,837	6.0%	$ 66,410	40%	$ 26,564
SITE SERVICES	$ 1,479,014	3.0%	$ 44,370	40%	$ 17,748
OXYGEN PLANT	$ -	3.0%	$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
Mobile Equipment			$ -	80%	$ -
Maintenance General					
Maintenance software			$ 100,000	100%	$ 100,000
Maintenance manuals			$ 100,000	100%	$ 100,000
Maintenance training			$ 100,000	100%	$ 100,000
Contract Labour					
Hire equipment service agreements			$ -	100%	$ -
SAG Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
Ball Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
TOTAL			$ 1,957,463		$ 962,985

NOTES:

1. Mobile equipment maintenance excluded
2. Maintenance Cost Estimate based on Capital Cost Estimate

strategic METALLURGY

Plant throughput 1,000,000 tpa

LABORATORY COST SUMMARY

Shifts per day 2

Assay Requirement	Shift	Daily	Weekly	Monthly	Total Assays	Outside %	Internal %	External AUD$/sample	Internal AUD$/sample	External AUD$/y	Internal AUD$/y	TOTAL AUD$/y
Solids Assays												
Mill Feed - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Flotation feed-Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Rougher Concentrate - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Scavenger Tailings - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Cleaner Tailings - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Cleaner Concentrate - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
POX feed - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Feed - Au, S, S2-	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Metallurgical Testing (flotation)- Ni, Cu, Fe, Mg				10	2,400	50%	50%	$ 60	$ 100	$ 75,000	$ 60,000	$ 135,000
Solution Assays												
ILR PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Neutralisation Feed					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Neutralisation Tails					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Leach Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Final Tails- Au, Free CN, WAD CN					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Elution PLS- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Elution BLS- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Carbon Assays												
Adsorbance Tk 1- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
Loaded Carbon- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
Barren Carbon- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
GIC- Solid Assays												
Concentrate Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut filter feed tank- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 1 - Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Solutions												
Leach Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Carbon												
Adsorbance Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 2- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 3- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 4- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 5- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 6- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Miscellaneous												
Mill Feed Moisture	1				730	0%	100%	$ 20	$ 8	$ -	$ 5,475	$ 5,475
Flotation Concentrate Sizing	1		1	1	794	0%	100%	$ 30	$ 8	$ -	$ 5,955	$ 5,955
Environmental Samples			5	10	380	0%	100%	$ 30	$ 10	$ -	$ 3,800	$ 3,800
Water Quality Samples			2	2	128	0%	100%	$ 30	$ 10	$ -	$ 1,280	$ 1,280
Sulphur assays	6				4,380	0%	100%	$ 30	$ 15	$ -	$ 65,700	$ 65,700
Metallurgical Testing				10	120	50%	50%	$ 1,000	$ 1,000	$ 60,000	$ 60,000	$ 120,000
Mine Grade Control												
Grade Control		50			18,250	0%	100%	$ 30	$ 15	$ -	$273,750	$ 273,750
Subtotal					46,283					$135,000	$666,970	$ 801,970
Replacement Glassware												$ 45,000
Miscellaneous												$ 50,000
TOTAL												$ 896,970

NOTES:

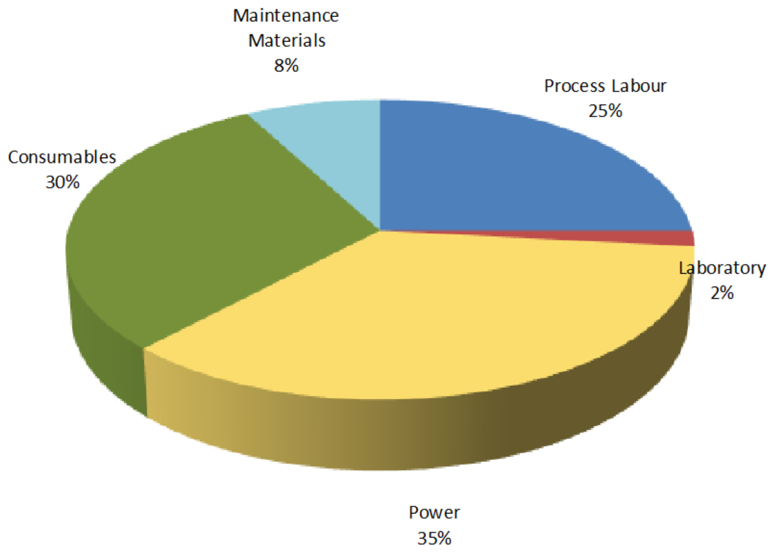
1. Grade Control Sampling Cost excluded

8.12 Detailed operating cost – Case 2: 2Mtpa

Project:	Minyari Dome Gold Project
Client:	Antipa
Description:	High-level cost estimation
Rev:	DRAFT
Plant throughput	2,000,000 tpa

OPERATING COST SUMMARY

	Total Cost		% Fixed	Fixed		% Variable	Variable	
	AUD$/yr	AUD$/t		AUD$/yr	AUD$/t		AUD$/yr	AUD$/t
Operating Consumables	$ 15,879,780	$ 7.94	0%	$ -	$ -	100%	$ 15,879,780	$ 7.94
Process Labour	$ 13,224,650	$ 6.61	100%	$ 13,224,650	$ 6.61	0%	$ -	$ -
Power	$ 18,705,389	$ 9.35	30%	$ 5,602,607	$ 2.80	70%	$ 13,102,782	$ 6.55
Laboratory	$ 896,970	$ 0.45	80%	$ 717,576	$ 0.36	20%	$ 179,394	$ 0.09
Maintenance Materials	$ 4,172,427	$ 2.09	32%	$ 1,320,693	$ 0.66	68%	$ 2,851,734	$ 1.43
TOTAL PROCESSING COST	$ 52,879,216	$ 26.44	39%	$ 20,865,527	$ 10.43	61%	$ 32,013,690	$ 16.01



Plant throughput 2,000,000 tpa

PROCESS CONSUMABLES COST SUMMARY

Operating Consumable	Consumable	Consumption rate (Unit/measure)	Annual consumption (Unit/annum)	UOM	Delivery size	Consumable item direct costs			Total Cost	Totals	Supplier
						Supplied Cost AUD$/unit	Transport AUD$/unit	Cost to site AUD$/unit	AUD$/unit	Consumable cost $/annum	
Crushing											
Primary Crusher	*Complete*	4.1 set(s)/y	4.1 set(s)/y	set	1	$ 25,000	$ 2,500	$ 27,500	$ 27,500	$ 112,420	Metso
Grinding									$ -		
SAG Mill	*Wear Liners*	1.5 set(s)/y	1.5 set(s)/y	set	1	$ 1,000,000	$ 10,000	$ 1,010,000	$ 1,010,000	$ 1,515,000	Warman
	Grinding Media	0.210 kg/t	420tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ 756,000	Orica
Ball Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 600,000	$ 10,000	$ 610,000	$ 610,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Ball Mill- Limestone	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 400,000	$ 10,000	$ 410,000	$ 410,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Tower Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 100,000	$ 10,000	$ 110,000	$ 110,000	$ -	
	Impeller consumables			lot				$ -	$ -	$ -	
	Grinding Media	0.000 kg/t	0tpa	t	5	$ 2,500	$ 300	$ 2,800	$ 2,800	$ -	Metso
Pebble Crusher	*Mantle/Concave Set*	4.0 set(s)/y	4.0 set(s)/y	set	1	$ 50,000	$ 2,500	$ 52,500	$ 52,500	$ 210,000	Metso
Concentrate Filtration											
Filter Components	*Cloths*	30 cloths/qtr	120 cloths/y	set	60	$ 208	$ 8	$ 216	$ 216	$ 25,860	
Filter Components	*Plates*	10.0 set(s)/y	10.0 set(s)/y	set		$ 10,000	$ 500	$ 10,500	$ 10,500	$ 105,000	Metso
Reagents									$ -		
Potassium Amyl Xanthate	*Flotation*	0.20 kg/t	400tpa	t	20	$ 2,800	$ 300	$ 3,100	$ 3,100	$ 1,240,000	Orica
Frother	*Flotation*	0.05 kg/t	100tpa	t	20	$ 4,700	$ 300	$ 5,000	$ 5,000	$ 500,000	Orica
Copper sulphate	*Flotation*	0.10 kg/t	200tpa	t	20	$ 3,900	$ 300	$ 4,200	$ 4,200	$ 840,000	Database
Quicklime	*Flotation*	0.75 kg/t	1,500tpa	t	20			$ 290	$ 290	$ 435,000	Cockburn Cement
Dithiophosphine	*Flotation*	0.02 kg/t	40tpa	t	27	$ 15,000	$ 300	$ 15,300	$ 15,300	$ 612,000	WA Limestone
Sulfuric acid	*Flotation*	12.0 kg/t	24,000tpa	t	20			$ 150	$ 150	$ 3,600,000	Database
Sodium silicate	*Flotation*	0.20 kg/t	400tpa	t		$ 1,200	$ 300	$ 1,500		$ 600,000	BASF
Sodium Sulfite	*Flotation*	0.40 kg/t	800tpa	t	20	$ 720		$ 3,000	$ 3,000	$ 2,400,000	Database
Triethylene tetraamine	*Flotation*	0.10 kg/t	200tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 780,000	Database
Sodium Hydroxide	*Elution*	0.00 kg/t	0tpa	t	20	$ 320	$ 160	$ 480	$ 480	$ -	Coogee Chemicals
Hydrochloric acid	*Elution*	0.00 kg/t	0tpa	t	20			$ 610	$ 610	$ -	Coogee Chemicals
Hydrogen peroxide	*Cyanide Destruct*	0.00 kg/t	0tpa	t	20			$ 1,247	$ 1,247	$ -	Evonik
Lead Nitrate	*Pyrite leach*		0tpa	t		$ 2,620	$ 300	$ 2,920	$ 2,920	$ -	Esease
Flocculant	*Thickening*	0.11 kg/t	220tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 858,000	Ciba
Water Treatment and Cleaning											
Water Treatment	*Potable Water*	100,000 kL/yr	100,000 kL/yr	kL					$ 0	$ 15,000	TBA
Antiscalant	*Decant Return Water*	18,000 L/yr	18,000 L/yr	t	TBA	$ 2,500	$ -	$ 2,500	$ 2,500	$ 45,000	TBA
Antiscalant	*Raw water*	12,000 L/yr	12,000 L/yr	t	TBA	$ 4,100	$ -	$ 4,100	$ 4,100	$ 49,200	TBA
Cooling Tower dosing pack	*Allowance*			lot						$ -	
Sulphamic Acid	*Cleaning*	0 kg/yr	0 kg/yr	t	TBA	$ 1,880	$ -	$ 1,880	$ 1,880	$ -	TBA
General											
Mill Lubricants	*Allowance*	$ 150,000	$ 150,000	lot		$ 150,000	$ 2,500	$ 152,500	$ 152,500	$ 152,500	TBA
Cyclone spares	*Allowance*	$ 30,000	$ 30,000	lot		$ 30,000	$ 1,000	$ 31,000	$ 31,000	$ 31,000	TBA
Mobile and hire equipment	*Allowance*	$ 300,000	$ 300,000	lot		$ 300,000		$ 300,000	$ 300,000	$ 300,000	TBA
General Supplies	*Allowance*	$ 50,000	$ 50,000	lot		$ 50,000	$ 1,000	$ 51,000	$ 51,000	$ 51,000	TBA
Operator Consumables	*Allowance*	$ 7,600	$ 7,600	person		$ 7,600	$ 100	$ 7,700	$ 7,700	$ 646,800	TBA
TOTAL CONSUMABLE COST										$ 15,879,780	

Notes:

1.) Excludes Mining Cost
2.) Transport cost allowance of $300 per tonne
3.) Assume municipal water supply for potable water, no cost

Plant throughput 2,000,000 tpa

POWER COST SUMMARY

Area	Power		Consumption		Cost	
	Installed	Average Continuous Draw	Annual	Rate	Annual	Rate
	(kW)	(kW)	(kW)	(kWh/t)	(AUD$)	AUD$/t
Crushing	810	397	3,476,844	1.74	$ 1,050,955	$ 0.53
Coarse Ore Storage	144	92	806,400	0.40	$ 243,753	$ 0.12
Grinding & Classification	4648	3821	33,476,162	16.74	$ 10,118,931	$ 5.06
Flotation	1424	1024	8,968,453	4.48	$ 2,710,919	$ 1.36
Flotation Tails Thickener and Process Water Recovery	199	87	763,281	0.38	$ 230,719	$ 0.12
Fine Grinding	861	649	5,689,171	2.84	$ 1,719,681	$ 0.86
Cyanidation	0	0	-	0.00	$ -	$ -
Cyanidation Tailings Thickening and Process Water Recovery	0	0	-	0.00	$ -	$ -
Elution and Goldroom	0	0	-	0.00	$ -	$ -
Carbon Regeneration	0	0	-	0.00	$ -	$ -
Reagents Area	255	119	1,044,070	0.52	$ 315,594	$ 0.16
Water Services Total	440	191	1,676,800	0.84	$ 506,851	$ 0.25
Air Services Total	1165	665	5,824,000	2.91	$ 1,760,436	$ 0.88
Oxygen Plant	0	0	-	0.00	$ -	$ -
Administration, Workshop and Store Total	10	7	57,956	0.03	$ 17,519	$ -
Laboratory Total	18	11	99,353	0.05	$ 30,032	$ 0.02
TOTAL	9,974	7,064	61,882,491	30.94	$ 18,705,389	$ 9.34

LABOUR COST (CONTRACT MAINTENANCE)

Title	Category	Number	Days	Hours/Day	Rate (AUD$/h)	Total Cost (AUD$)	Roster /year
General							
Monthly	Mechanical Trades	0	3	12	$ 100	$ -	12
	Electrical Trades	0	3	12	$ 120	$ -	12
3 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	4
	Electrical Trades	0	3	12	$ 120	$ -	4
6 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	2
	Electrical Trades	0	3	12	$ 120	$ -	2
Mill Relines							
6 Monthly	Mechanical Trades	12	2	12	$ 100	$ 57,600	2
12 Monthly	Mechanical Trades	24	4	12	$ 100	$ 115,200	1
Crusher							
Monthly	Mechanical Trades	12	2	12	$ 100	$ 345,600	12
TOTAL		48	26			$ 518,400	
					Unit Cost AUD$/t	$ 0.26	

Plant throughput 2,000,000 tpa

LABOUR COST SUMMARY (STAFF)

Position	Number	Salary each (AUD$)	Total (AUD$)	On Cost factor	Total Cost (AUD$)	Roster on:off
Production						
Processing Plant Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Production Superintendent	1	$ 200,000	$ 200,000	1.25	$ 250,000	2:1
Production Co-ordinator	2	$ 180,000	$ 360,000	1.25	$ 450,000	2:1
Senior Metallurgist	1	$ 160,000	$ 160,000	1.25	$ 200,000	2:1
Metallurgist	2	$ 130,000	$ 260,000	1.25	$ 325,000	2:1
Laboratory Manager	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Laboratory Technicians	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Shift Supervisor	3	$ 140,000	$ 420,000	1.25	$ 525,000	2:1
Process Technician (shift)	18	$ 115,000	$ 2,070,000	1.25	$ 2,587,500	2:1
Process Technician (day)	3	$ 100,000	$ 300,000	1.25	$ 375,000	2:1
ROM Loader Operater	3	$ 105,000	$ 315,000	1.25	$ 393,750	2:1
Sub-total	37		$ 4,665,000		$ 5,831,250	
Maintenance						
Maintenance Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Maintenance Superintendent	1	$ 180,000	$ 180,000	1.25	$ 225,000	2:1
Maintenance Planner	1	$ 150,000	$ 150,000	1.25	$ 187,500	2:1
Mechanical Maintenance Supervisor	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Maintenance Leading Hand	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Mechanical Fitter	5	$ 110,000	$ 550,000	1.25	$ 687,500	2:1
Apprentice Fitter	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Boilermaker Welder	5	$ 110,000	$ 550,000	1.25	$ 687,500	2:1
Apprentice Boilermaker	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Electrical Maintenance Supervisor	2	$ 150,000	$ 300,000	1.25	$ 375,000	2:1
Electrician/Instrument Technician	4	$ 130,000	$ 520,000	1.25	$ 650,000	2:1
Apprentice Electrician	2	$ 80,000	$ 160,000	1.25	$ 200,000	2:1
Trades Assistants	3	$ 80,000	$ 240,000	1.25	$ 300,000	2:1
Sub-total	29		$ 3,410,000		$ 4,262,500	
Admin						
General Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Commercial Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
OHS and Enviromental Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
Enviromental Supernintendent	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Accountant	1	$ 110,000	$ 110,000	1.25	$ 137,500	0:00
OHS Officer	2	$ 110,000	$ 220,000	1.25	$ 275,000	0:00
Enviromental Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Storeman	3	$ 100,000	$ 300,000	1.25	$ 375,000	0:00
Admin	2	$ 80,000	$ 160,000	1.25	$ 200,000	0:00
Training Coordinator	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Purchasing Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	0:00
Sub-total	18		$ 2,090,000		$ 2,612,500	
TOTAL	84		$ 8,075,000		$ 12,706,250	
				Unit cost AUD$/t	$ 6.35	

Notes:
1. All shift personnel working 12 hour shifts
2. All Personnel FIFO
3. On cost factor includes superannuation, payroll tax and workers compensation insurance
4. Shift operators are as follows: control room (1), crushing and grinding (1), flotation (1), CIL(0), reagents and dewatering (1), elution and goldroom (0), Filters (1), concentrate loadout (1).
5. Shift operators are allocated as follows: process technicians (20), shift supervisors (3) and ROM loader operator (4)
6. No accommodation or flight costs are included

Plant throughput 2,000,000 tpa

MAINTENANCE COST SUMMARY

Area	Capital Cost (Supply) AUD$	Maintenance Consumables Factor (%)	Maintenance Consumables Cost (AUD$/year)	% Fixed	Maintenance Cost Fixed (AUD$/year)
Plant Maintenance					
CRUSHING	$ 2,823,931	6.0%	$ 169,436	40%	$ 67,774
COARSE ORE STORAGE AND RECLAIM	$ 1,946,191	6.0%	$ 116,771	40%	$ 46,709
GRINDING AND CLASSIFICATION	$ 7,959,588	6.0%	$ 477,575	40%	$ 191,030
GRAVITY	$ 745,775	6.0%	$ 44,746	40%	$ 17,899
FLOTATION	$ 10,379,768	6.0%	$ 622,786	40%	$ 249,114
FINE GRIND AND CLASSIFICATION	$ 2,318,827	12.0%	$ 278,259	40%	$ 111,304
CYANIDATION	$ -	6.0%	$ -	40%	$ -
GOLD RECOVERY	$ -	6.0%	$ -	40%	$ -
CARBON REGENERATION	$ -	3.0%	$ -	40%	$ -
TAILINGS	$ 2,600,772	3.0%	$ 78,023	40%	$ 31,209
FLOTATION CONC THICKENER	$ 518,027	3.0%	$ 15,541	40%	$ 6,216
CONC FILTER	$ 4,839,026	12.0%	$ 580,683	40%	$ 232,273
REAGENTS- MIXING AND DISTRIBUTION	$ 1,677,651	6.0%	$ 100,659	40%	$ 40,264
SITE SERVICES	$ 2,241,766	3.0%	$ 67,253	40%	$ 26,901
OXYGEN PLANT	$ -	3.0%	$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
Mobile Equipment			$ -	80%	$ -
Maintenance General					
Maintenance software			$ 100,000	100%	$ 100,000
Maintenance manuals			$ 100,000	100%	$ 100,000
Maintenance training			$ 100,000	100%	$ 100,000
Contract Labour					
Hire equipment service agreements			$ -	100%	$ -
SAG Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
Ball Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
TOTAL			$ 2,851,734		$ 1,320,693

NOTES:

1. Mobile equipment maintenance excluded
2. Maintenance Cost Estimate based on Capital Cost Estimate

Plant throughput 2,000,000 tpa

LABORATORY COST SUMMARY

Shifts per day 2

Assay Requirement	Shift	Daily	Weekly	Monthly	Total Assays	Outside %	Internal %	External AUD$/sample	Internal AUD$/sample	External AUD$/y	Internal AUD$/y	TOTAL AUD$/y
Solids Assays												
Mill Feed - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Flotation feed-Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Rougher Concentrate - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Scavenger Tailings - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Cleaner Tailings - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Cleaner Concentrate - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
POX feed - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Feed - Au, S, S2-	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Metallurgical Testing (flotation)- Ni, Cu, Fe, Mg				10	2,400	50%	50%	$ 60	$ 100	$ 75,000	$ 60,000	$ 135,000
Solution Assays												
ILR PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Neutralisation Feed					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Neutralisation Tails					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Leach Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Final Tails- Au, Free CN, WAD CN					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Elution PLS- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Elution BLS- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Carbon Assays												
Adsorbance Tk 1- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
Loaded Carbon- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
Barren Carbon- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
GIC- Solid Assays												
Concentrate Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut filter feed tank- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 1 - Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Solutions												
Leach Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Carbon												
Adsorbance Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 2- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 3- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 4- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 5- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 6- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Miscellaneous												
Mill Feed Moisture	1				730	0%	100%	$ 20	$ 8	$ -	$ 5,475	$ 5,475
Flotation Concentrate Sizing	1		1	1	794	0%	100%	$ 30	$ 8	$ -	$ 5,955	$ 5,955
Environmental Samples			5	10	380	0%	100%	$ 30	$ 10	$ -	$ 3,800	$ 3,800
Water Quality Samples			2	2	128	0%	100%	$ 30	$ 10	$ -	$ 1,280	$ 1,280
Sulphur assays	6				4,380	0%	100%	$ 30	$ 15	$ -	$ 65,700	$ 65,700
Metallurgical Testing				10	120	50%	50%	$ 1,000	$ 1,000	$ 60,000	$ 60,000	$ 120,000
Mine Grade Control												
Grade Control		50			18,250	0%	100%	$ 30	$ 15	$ -	$273,750	$ 273,750
Subtotal					46,283					$135,000	$666,970	$ 801,970
Replacement Glassware												$ 45,000
Miscellaneous												$ 50,000
TOTAL												$ 896,970

NOTES:

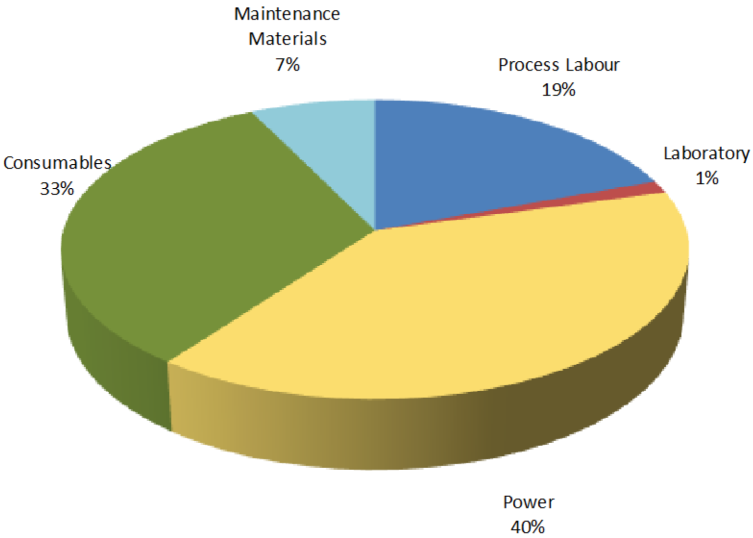
1. Grade Control Sampling Cost excluded

8.13 Detailed operating cost – Case 2: 3Mtpa

Project:	Minyari Dome Gold Project
Client:	Antipa
Description:	High-level cost estimation
Rev:	DRAFT
Plant throughput	3,000,000 tpa

OPERATING COST SUMMARY

	Total Cost		% Fixed	Fixed		% Variable	Variable	
	AUD$/yr	AUD$/t		AUD$/yr	AUD$/t		AUD$/yr	AUD$/t
Operating Consumables	$ 22,190,280	$ 7.40	0%	$ -	$ -	100%	$ 22,190,280	$ 7.40
Process Labour	$ 13,224,650	$ 4.41	100%	$ 13,224,650	$ 4.41	0%	$ -	$ -
Power	$ 26,924,577	$ 8.97	30%	$ 8,068,364	$ 2.69	70%	$ 18,856,213	$ 6.29
Laboratory	$ 896,970	$ 0.30	80%	$ 717,576	$ 0.24	20%	$ 179,394	$ 0.06
Maintenance Materials	$ 4,975,450	$ 1.66	31%	$ 1,550,129	$ 0.52	69%	$ 3,425,321	$ 1.14
TOTAL PROCESSING COST	$ 68,211,927	$ 22.74	35%	$ 23,560,718	$ 7.85	65%	$ 44,651,209	$ 14.88



strategic METALLURGY

Plant throughput 3,000,000 tpa

PROCESS CONSUMABLES COST SUMMARY

Operating Consumable	Consumable	Consumption rate (Unit/measure)	Annual consumption (Unit/annum)	UOM	Delivery size	Consumable item direct costs			Total Cost	Totals	Supplier
						Supplied Cost AUD$/unit	Transport AUD$/unit	Cost to site AUD$/unit	AUD$/unit	Consumable cost $/annum	
Crushing											
Primary Crusher	*Complete*	4.1 set(s)/y	4.1 set(s)/y	set	1	$ 25,000	$ 2,500	$ 27,500	$ 27,500	$ 112,420	Metso
Grinding									$ -		
SAG Mill	*Wear Liners*	1.5 set(s)/y	1.5 set(s)/y	set	1	$ 1,000,000	$ 10,000	$ 1,010,000	$ 1,010,000	$ 1,515,000	Warman
	Grinding Media	0.210 kg/t	630tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ 1,134,000	Orica
Ball Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 600,000	$ 10,000	$ 610,000	$ 610,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Ball Mill- Limestone	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 400,000	$ 10,000	$ 410,000	$ 410,000	$ -	Warman
	Grinding Media	0.000 kg/t	0tpa	t	25	$ 1,500	$ 300	$ 1,800	$ 1,800	$ -	Orica
Tower Mill	*Wear Liners*	0.0 set(s)/y	0.0 set(s)/y	set	1	$ 100,000	$ 10,000	$ 110,000	$ 110,000	$ -	
	Impeller consumables			lot				$ -	$ -	$ -	
	Grinding Media	0.000 kg/t	0tpa	t	5	$ 2,500	$ 300	$ 2,800	$ 2,800	$ -	Metso
Pebble Crusher	*Mantle/Concave Set*	4.0 set(s)/y	4.0 set(s)/y	set	1	$ 50,000	$ 2,500	$ 52,500	$ 52,500	$ 210,000	Metso
Concentrate Filtration											
Filter Components	*Cloths*	30 cloths/qtr	120 cloths/y	set	60	$ 208	$ 8	$ 216	$ 216	$ 25,860	
Filter Components	*Plates*	10.0 set(s)/y	10.0 set(s)/y	set		$ 10,000	$ 500	$ 10,500	$ 10,500	$ 105,000	Metso
Reagents									$ -		
Potassium Amyl Xanthate	*Flotation*	0.20 kg/t	600tpa	t	20	$ 2,800	$ 300	$ 3,100	$ 3,100	$ 1,860,000	Orica
Frother	*Flotation*	0.05 kg/t	150tpa	t	20	$ 4,700	$ 300	$ 5,000	$ 5,000	$ 750,000	Orica
Copper sulphate	*Flotation*	0.10 kg/t	300tpa	t	20	$ 3,900	$ 300	$ 4,200	$ 4,200	$ 1,260,000	Database
Quicklime	*Flotation*	0.75 kg/t	2,250tpa	t	20			$ 290	$ 290	$ 652,500	Cockburn Cement
Dithiophosphine	*Flotation*	0.02 kg/t	60tpa	t	27	$ 15,000	$ 300	$ 15,300	$ 15,300	$ 918,000	WA Limestone
Sulfuric acid	*Flotation*	12.0 kg/t	36,000tpa	t	20			$ 150	$ 150	$ 5,400,000	Database
Sodium silicate	*Flotation*	0.20 kg/t	600tpa	t		$ 1,200	$ 300	$ 1,500		$ 900,000	BASF
Sodium Sulfite	*Flotation*	0.40 kg/t	1,200tpa	t	20	$ 720		$ 3,000	$ 3,000	$ 3,600,000	Database
Triethylene tetraamine	*Flotation*	0.10 kg/t	300tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 1,170,000	Database
Sodium Hydroxide	*Elution*	0.00 kg/t	0tpa	t	20	$ 320	$ 160	$ 480	$ 480	$ -	Coogee Chemicals
Hydrochloric acid	*Elution*	0.00 kg/t	0tpa	t	20			$ 610	$ 610	$ -	Coogee Chemicals
Hydrogen peroxide	*Cyanide Destruct*	0.00 kg/t	0tpa	t	20			$ 1,247	$ 1,247	$ -	Evonik
Lead Nitrate	*Pyrite leach*		0tpa	t		$ 2,620	$ 300	$ 2,920	$ 2,920	$ -	Esease
Flocculant	*Thickening*	0.11 kg/t	0tpa	t	20	$ 3,600	$ 300	$ 3,900	$ 3,900	$ 1,287,000	Ciba
Water Treatment and Cleaning											
Water Treatment	*Potable Water*	100,000 kL/yr	100,000 kL/yr	kL					$ 0	$ 15,000	TBA
Antiscalant	*Decant Return Water*	18,000 L/yr	18,000 L/yr	t	TBA	$ 2,500	$ -	$ 2,500	$ 2,500	$ 45,000	TBA
Antiscalant	*Raw water*	12,000 L/yr	12,000 L/yr	t	TBA	$ 4,100	$ -	$ 4,100	$ 4,100	$ 49,200	TBA
Cooling Tower dosing pack	*Allowance*			lot						$ -	
Sulphamic Acid	*Cleaning*	0 kg/yr	0 kg/yr	t	TBA	$ 1,880	$ -	$ 1,880	$ 1,880	$ -	TBA
General											
Mill Lubricants	*Allowance*	$ 150,000	$ 150,000	lot		$ 150,000	$ 2,500	$ 152,500	$ 152,500	$ 152,500	TBA
Cyclone spares	*Allowance*	$ 30,000	$ 30,000	lot		$ 30,000	$ 1,000	$ 31,000	$ 31,000	$ 31,000	TBA
Mobile and hire equipment	*Allowance*	$ 300,000	$ 300,000	lot		$ 300,000		$ 300,000	$ 300,000	$ 300,000	TBA
General Supplies	*Allowance*	$ 50,000	$ 50,000	lot		$ 50,000	$ 1,000	$ 51,000	$ 51,000	$ 51,000	TBA
Operator Consumables	*Allowance*	$ 7,600	$ 7,600	person		$ 7,600	$ 100	$ 7,700	$ 7,700	$ 646,800	TBA
TOTAL CONSUMABLE COST										$ 22,190,280	

Notes:

1.) Excludes Mining Cost

2.) Transport cost allowance of $300 per tonne

3.) Assume municipal water supply for potable water, no cost

Plant throughput 3,000,000 tpa

POWER COST SUMMARY

Area	Power		Consumption		Cost	
	Installed	Average Continuous Draw	Annual	Rate	Annual	Rate
	(kW)	(kW)	(kW)	(kWh/t)	(AUD$)	AUD$/t
Crushing	810	397	3,476,844	1.16	$ 1,050,955	$ 0.35
Coarse Ore Storage	144	92	806,400	0.27	$ 243,753	$ 0.08
Grinding & Classification	7007	5803	50,830,093	16.94	$ 15,364,551	$ 5.12
Flotation	2103	1473	12,903,046	4.30	$ 3,900,239	$ 1.30
Flotation Tails Thickener and Process Water Recovery	263	115	1,008,407	0.34	$ 304,814	$ 0.10
Fine Grinding	1241	950	8,325,698	2.78	$ 2,516,632	$ 0.84
Cyanidation	0	0	-	0.00	$ -	$ -
Cyanidation Tailings Thickening and Process Water Recovery	0	0	-	0.00	$ -	$ -
Elution and Goldroom	0	0	-	0.00	$ -	$ -
Carbon Regeneration	0	0	-	0.00	$ -	$ -
Reagents Area	276	131	1,145,990	0.38	$ 346,402	$ 0.12
Water Services Total	560	244	2,137,600	0.71	$ 646,138	$ 0.22
Air Services Total	1634	945	8,282,400	2.76	$ 2,503,544	$ 0.83
Oxygen Plant	0	0	-	0.00	$ -	$ -
Administration, Workshop and Store Total	10	7	57,956	0.02	$ 17,519	$ -
Laboratory Total	18	11	99,353	0.03	$ 30,032	$ 0.01
TOTAL	14,066	10,168	89,073,789	29.69	$ 26,924,577	$ 8.97

LABOUR COST (CONTRACT MAINTENANCE)

Title	Category	Number	Days	Hours/Day	Rate (AUD$/h)	Total Cost (AUD$)	Roster /year
General							
Monthly	Mechanical Trades	0	3	12	$ 100	$ -	12
	Electrical Trades	0	3	12	$ 120	$ -	12
3 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	4
	Electrical Trades	0	3	12	$ 120	$ -	4
6 Monthly	Mechanical Trades	0	3	12	$ 100	$ -	2
	Electrical Trades	0	3	12	$ 120	$ -	2
Mill Relines							
6 Monthly	Mechanical Trades	12	2	12	$ 100	$ 57,600	2
12 Monthly	Mechanical Trades	24	4	12	$ 100	$ 115,200	1
Crusher							
Monthly	Mechanical Trades	12	2	12	$ 100	$ 345,600	12
TOTAL		48	26			$ 518,400	
					Unit Cost AUD$/t	$ 0.17	

Plant throughput 3,000,000 tpa

LABOUR COST SUMMARY (STAFF)

Position	Number	Salary each (AUD$)	Total (AUD$)	On Cost factor	Total Cost (AUD$)	Roster on:off
Production						
Processing Plant Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Production Superintendent	1	$ 200,000	$ 200,000	1.25	$ 250,000	2:1
Production Co-ordinator	2	$ 180,000	$ 360,000	1.25	$ 450,000	2:1
Senior Metallurgist	1	$ 160,000	$ 160,000	1.25	$ 200,000	2:1
Metallurgist	2	$ 130,000	$ 260,000	1.25	$ 325,000	2:1
Laboratory Manager	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Laboratory Technicians	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Shift Supervisor	3	$ 140,000	$ 420,000	1.25	$ 525,000	2:1
Process Technician (shift)	18	$ 115,000	$ 2,070,000	1.25	$ 2,587,500	2:1
Process Technician (day)	3	$ 100,000	$ 300,000	1.25	$ 375,000	2:1
ROM Loader Operater	3	$ 105,000	$ 315,000	1.25	$ 393,750	2:1
Sub-total	37		$ 4,665,000		$ 5,831,250	
Maintenance						
Maintenance Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Maintenance Superintendent	1	$ 180,000	$ 180,000	1.25	$ 225,000	2:1
Maintenance Planner	1	$ 150,000	$ 150,000	1.25	$ 187,500	2:1
Mechanical Maintenance Supervisor	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Maintenance Leading Hand	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Mechanical Fitter	5	$ 110,000	$ 550,000	1.25	$ 687,500	2:1
Apprentice Fitter	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Boilermaker Welder	5	$ 110,000	$ 550,000	1.25	$ 687,500	2:1
Apprentice Boilermaker	1	$ 80,000	$ 80,000	1.25	$ 100,000	2:1
Electrical Maintenance Supervisor	2	$ 150,000	$ 300,000	1.25	$ 375,000	2:1
Electrician/Instrument Technician	4	$ 130,000	$ 520,000	1.25	$ 650,000	2:1
Apprentice Electrician	2	$ 80,000	$ 160,000	1.25	$ 200,000	2:1
Trades Assistants	3	$ 80,000	$ 240,000	1.25	$ 300,000	2:1
Sub-total	29		$ 3,410,000		$ 4,262,500	
Admin						
General Manager	1	$ 250,000	$ 250,000	1.25	$ 312,500	2:1
Commercial Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
OHS and Enviromental Manager	1	$ 150,000	$ 150,000	1.25	$ 187,500	0:00
Enviromental Supernintendent	1	$ 130,000	$ 130,000	1.25	$ 162,500	2:1
Accountant	1	$ 110,000	$ 110,000	1.25	$ 137,500	0:00
OHS Officer	2	$ 110,000	$ 220,000	1.25	$ 275,000	0:00
Enviromental Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	2:1
Storeman	3	$ 100,000	$ 300,000	1.25	$ 375,000	0:00
Admin	2	$ 80,000	$ 160,000	1.25	$ 200,000	0:00
Training Coordinator	2	$ 110,000	$ 220,000	1.25	$ 275,000	2:1
Purchasing Officer	2	$ 100,000	$ 200,000	1.25	$ 250,000	0:00
Sub-total	18		$ 2,090,000		$ 2,612,500	
TOTAL	84		$ 8,075,000		$ 12,706,250	
				Unit cost AUD$/t	$ 4.24	

Notes:
1. All shift personnel working 12 hour shifts
2. All Personnel FIFO
3. On cost factor includes superannuation, payroll tax and workers compensation insurance
4. Shift operators are as follows: control room (1), crushing and grinding (1), flotation (1), CIL(0), reagents and dewatering (1), elution and goldroom (0), Filters (1), concentrate loadout (1).
5. Shift operators are allocated as follows: process technicians (20), shift supervisors (3) and ROM loader operator (4)
6. No accommodation or flight costs are included

Plant throughput 3,000,000 tpa

MAINTENANCE COST SUMMARY

Area	Capital Cost (Supply) AUD$	Maintenance Consumables Factor (%)	Maintenance Consumables Cost (AUD$/year)	% Fixed	Maintenance Cost Fixed (AUD$/year)
Plant Maintenance					
CRUSHING	$ 3,150,380	6.0%	$ 189,023	40%	$ 75,609
COARSE ORE STORAGE AND RECLAIM	$ 2,171,172	6.0%	$ 130,270	40%	$ 52,108
GRINDING AND CLASSIFICATION	$ 8,879,721	6.0%	$ 532,783	40%	$ 213,113
GRAVITY	$ 831,987	6.0%	$ 49,919	40%	$ 19,968
FLOTATION	$ 13,238,610	6.0%	$ 794,317	40%	$ 317,727
FINE GRIND AND CLASSIFICATION	$ 2,957,489	12.0%	$ 354,899	40%	$ 141,959
CYANIDATION	$ -	6.0%	$ -	40%	$ -
GOLD RECOVERY	$ -	6.0%	$ -	40%	$ -
CARBON REGENERATION	$ -	3.0%	$ -	40%	$ -
TAILINGS	$ 3,317,089	3.0%	$ 99,513	40%	$ 39,805
FLOTATION CONC THICKENER	$ 660,704	3.0%	$ 19,821	40%	$ 7,928
CONC FILTER	$ 6,171,812	12.0%	$ 740,617	40%	$ 296,247
REAGENTS- MIXING AND DISTRIBUTION	$ 2,139,717	6.0%	$ 128,383	40%	$ 51,353
SITE SERVICES	$ 2,859,203	3.0%	$ 85,776	40%	$ 34,310
OXYGEN PLANT	$ -	3.0%	$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
			$ -	40%	$ -
Mobile Equipment			$ -	80%	$ -
Maintenance General					
Maintenance software			$ 100,000	100%	$ 100,000
Maintenance manuals			$ 100,000	100%	$ 100,000
Maintenance training			$ 100,000	100%	$ 100,000
Contract Labour					
Hire equipment service agreements			$ -	100%	$ -
SAG Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
Ball Mill Liner Changes (1 x full set + 1 lifter change)			$ -	100%	$ -
TOTAL			$ 3,425,321		$ 1,550,129

NOTES:

1. Mobile equipment maintenance excluded
2. Maintenance Cost Estimate based on Capital Cost Estimate

Plant throughput 3,000,000 tpa

LABORATORY COST SUMMARY

Shifts per day 2

Assay Requirement	Shift	Daily	Weekly	Monthly	Total Assays	Outside %	Internal %	External AUD$/sample	Internal AUD$/sample	External AUD$/y	Internal AUD$/y	TOTAL AUD$/y
Solids Assays												
Mill Feed - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Flotation feed-Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Rougher Concentrate - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Scavenger Tailings - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Cleaner Tailings - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Cleaner Concentrate - Au, S, S^{2-}	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
POX feed - Au, S, S^{2-}		2			730	0%	100%	$ 30	$ 10	$ -	$ 7,300	$ 7,300
Leach Feed - Au, S, S2-	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Final Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR Tails- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Metallurgical Testing (flotation)- Ni, Cu, Fe, Mg				10	2,400	50%	50%	$ 60	$ 100	$ 75,000	$ 60,000	$ 135,000
Solution Assays												
ILR PLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
ILR BLS- Au	1	2			1,460	0%	100%	$ 30	$ 10	$ -	$ 14,600	$ 14,600
Neutralisation Feed					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Neutralisation Tails					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Leach Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Final Tails- Au, Free CN, WAD CN					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Elution PLS- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Elution BLS- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Carbon Assays												
Adsorbance Tk 1- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
Loaded Carbon- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
Barren Carbon- Au		1			365	0%	100%	$ 30	$ 10	$ -	$ 3,650	$ 3,650
GIC- Solid Assays												
Concentrate Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut Thickener- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Pre-neut filter feed tank- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 1 - Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Solutions												
Leach Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Leach Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 1- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 2- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 3- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 4- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 5- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
Adsorbance Tk 6- Au			1	1	64	0%	100%	$ 30	$ 10	$ -	$ 640	$ 640
GIC- Carbon												
Adsorbance Tk 1- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 2- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 3- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 4- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 5- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Adsorbance Tk 6- Au					0	0%	100%	$ 30	$ 10	$ -	$ -	$ -
Miscellaneous												
Mill Feed Moisture	1				730	0%	100%	$ 20	$ 8	$ -	$ 5,475	$ 5,475
Flotation Concentrate Sizing	1		1	1	794	0%	100%	$ 30	$ 8	$ -	$ 5,955	$ 5,955
Environmental Samples			5	10	380	0%	100%	$ 30	$ 10	$ -	$ 3,800	$ 3,800
Water Quality Samples			2	2	128	0%	100%	$ 30	$ 10	$ -	$ 1,280	$ 1,280
Sulphur assays	6				4,380	0%	100%	$ 30	$ 15	$ -	$ 65,700	$ 65,700
Metallurgical Testing				10	120	50%	50%	$ 1,000	$ 1,000	$ 60,000	$ 60,000	$ 120,000
Mine Grade Control												
Grade Control		50			18,250	0%	100%	$ 30	$ 15	$ -	$273,750	$ 273,750
Subtotal					46,283					$135,000	$666,970	$ 801,970
Replacement Glassware												$ 45,000
Miscellaneous												$ 50,000
TOTAL												$ 896,970

NOTES:

1. Grade Control Sampling Cost excluded