MT CARBINE BANKABLE FEASIBILITY STUDY

CHAPTER 1: EXECUTIVE SUMMARY

DECEMBER 2021

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1. Mt Carbine Expansion Project

1.1. Overview

Mt Carbine is an operating tungsten mine and rock quarry located 130 km north of the city of Cairns in Far North Queensland, Australia.

The mine is at the northern end of the Atherton Tableland approximately two hours (130 km) by sealed highway from the port and major centre of Cairns and 45 minutes from Port Douglas. There is a small historic hotel and caravan park adjacent to the mine site and a small town. The mine location is shown in Figure 1.

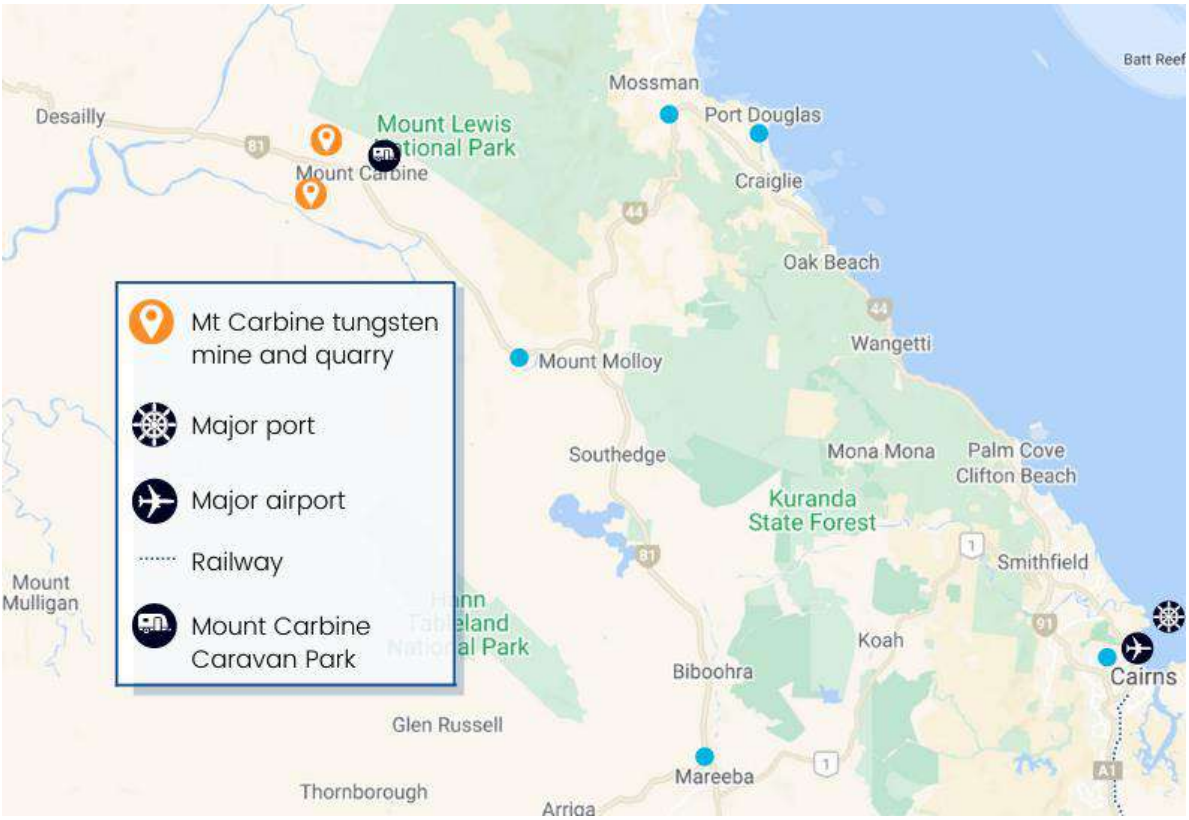


Figure 1: Mine Location

EQ Resources Limited (EQR) acquired a 100% interest in Mt Carbine Quarries Pty Ltd, an entity that owns mining leases ML4867 and ML4919 along with the associated Quarry in June 2019.

EQR has been operating the mine and quarry concurrently, with the mine currently processing tailings and low grade ore stockpiles located on the site that are remnant from previous operations on the site.

The mine is well supported by existing services and infrastructure.

1.2. History

The Mt Carbine tungsten deposit was discovered around 1883, with production first commencing in 1895.

A summary of the history of the Mt Carbine deposit is included in Table 1.

Table 1: History of Mt Carbine Asset Ownership and Activity

Company	Year	Year	Key Points
Individual Small miners	1883	1905	Underground vein operations
Irvinebank Co-op Company	1906	1918	Co-op Organized UG mining - site processing
Electric Ore Reduction Corp. Ltd.	1918	1920	Name change
Idle after 1919 decrease in Wolfram Prices			Low Tungsten Prices
North Broken Hill Ltd.	1967	1968	Drilled first 3 holes into Mt Carbine
R.B. Mining Pty. Ltd.	1968	1976	Designed and construct mine - Continue drilling
Qld Wolfram Pty. Ltd. & R.B. Mining Pty. Ltd.	1976	1986	10 years of Operational OC - 22Mt extracted
Poseidon Minerals Ltd. + Normandy Minerals Ltd.	1984	1993	JV. Designed UG & installed 420m of decline
Mt Carbine Quarries Pty. Ltd.	1993	2010	Purchase Licenses to run quarry
Icon Resources	2010	2011	Sublease the project for evaluation
Carbine Tungsten	2011	2015	Name change
Speciality Metals International	2015	2020	Name change
EQ Resources	**2020**	**Present**	**New resource and BFS**

1.3. Study Purpose

The purpose of this Bankable Feasibility Study (feasibility study or study) is to assess the cost and operational benefits of increasing the capacity and throughput of the existing processing plant to support the currently approved 1Mtpa mining rate of the low grade ore stockpiles located on the site.

Subsequently, the study will assess the cost and operational benefits the of recommencement of open pit mining from the existing pit and the introduction of a new stand-alone crushing, screening and x-ray transmission (XRT) sorting plant and additional processing plant upgrades to improve overall concentrate recovery to support the pit mining and introduction of high grade ore into the processing circuit.

The strategy for the feasibility study is to minimise the capital expenditure of the upgrade where possible and maximise the use of all existing on-site mining, processing and supporting infrastructure.

The low-grade ore stockpiles (LGS) are currently being mined by EQR. The infrastructure supporting the crushing, screening, ore sorting and processing activities already exist on the site and will continue to be used for the upgraded facility.

This feasibility study shall determine the scope for the first and second phases of a proposed multi-phase expansion of the Mt Carbine mine described below.

Phase 1 shall focus on minimal capital expenditure (capex), incremental improvements to increase the mine's productivity and profitability focusing solely on the mining and processing of the LGS.

Figure 2: Existing Crushing, Screening and Sorting Areas to be Optimised

Phase 2 will focus on the activities and works required to dewater and commence mining of the open pit. The crushing and screening plant and processing plant will be upgraded to further reduce operating costs and increase the tungsten recovery.

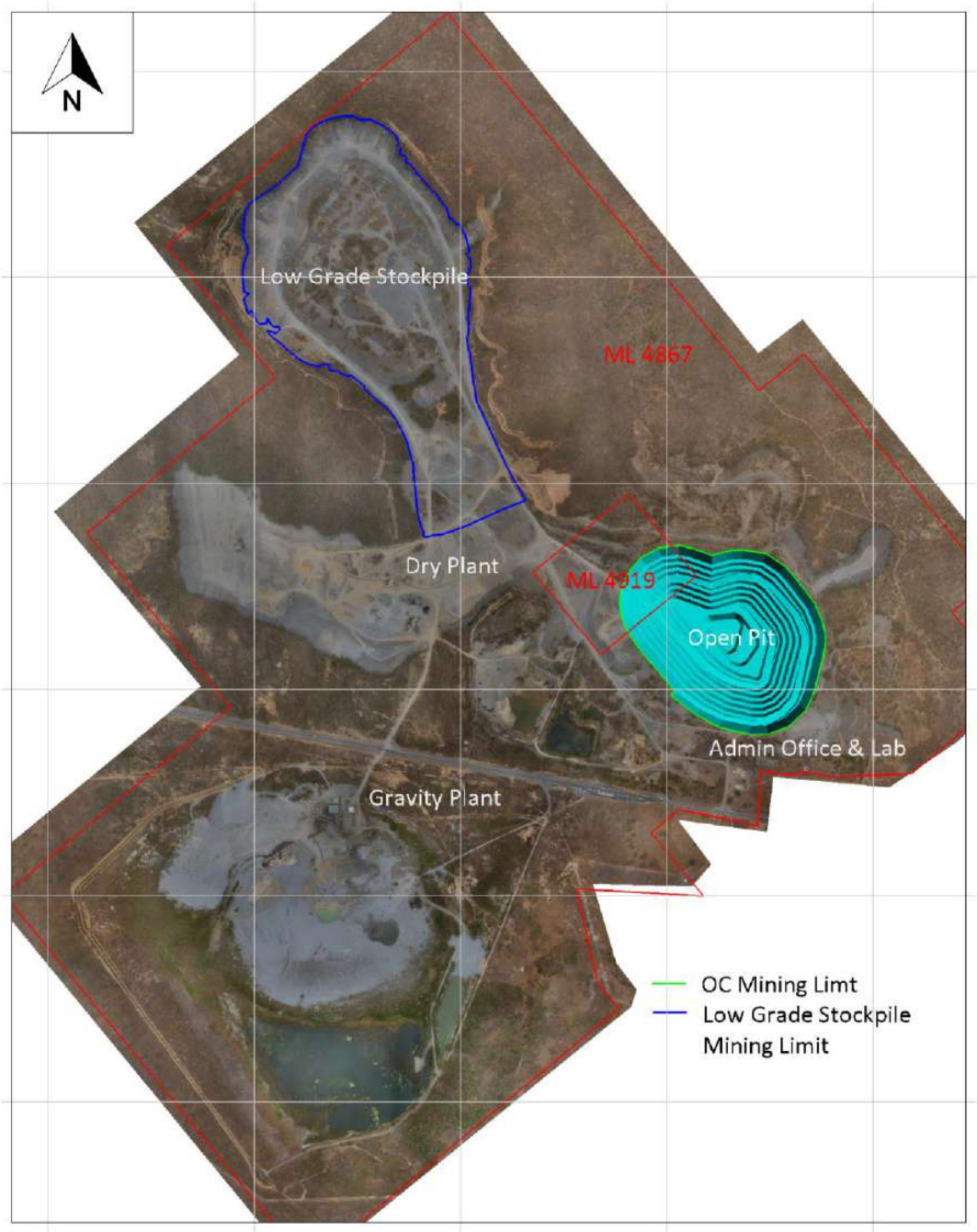


Figure 3: LGS & Open Pit locations relative to the Crushing and Screening Plant and Processing plant

Phase 3 (focus of future study) shall investigate commencement of underground mining activities at Mt Carbine to allow the continuation of mining once the open pit resource is exhausted. Figure 4 illustrates the significant underground resource opportunity that will be the focus of Phase 3.

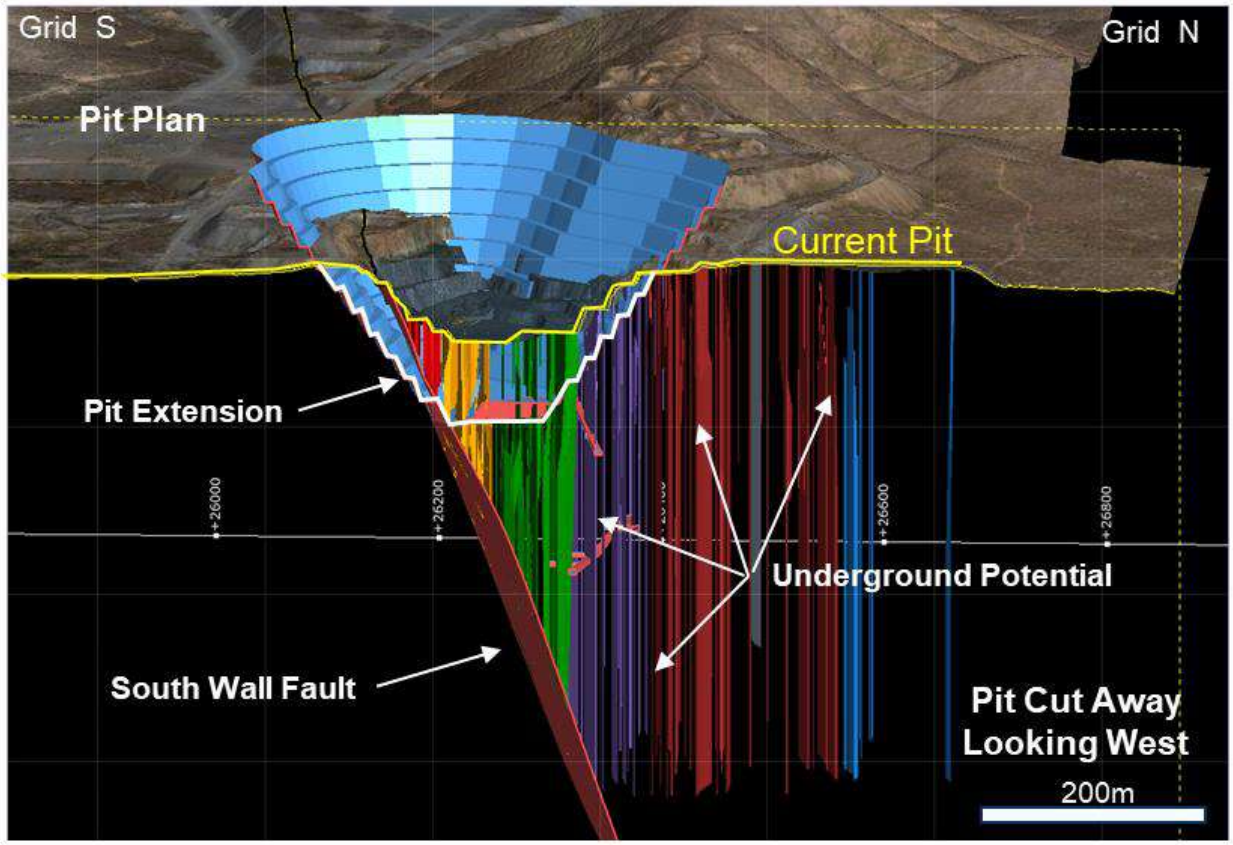


Figure 4: Pit Cross Section Depicting Underground Potential

1.4. Study Management

The feasibility study has been delivered utilising an integrated owner's team approach consisting of EQR and a Study Management Consultant. JukesTodd (JT) was appointed by EQR to lead this feasibility study.

JT is an experienced project manager and advisory group that worked in conjunction with EQR key personnel to deliver the study. JT supplies advisory and project management services with a philosophy of providing a strong link between the commercial and technical aspects of project feasibility, execution and operations.

With offices in Brisbane, Sydney and Perth, JukesTodd has delivered for clients in Australia, Asia, New Zealand, Africa, Europe and the Americas. JT has a strategic focus to support clients in developing commodities fundamental to current and emerging technologies including Tungsten, Copper, Gold, Vanadium, Lithium and Hydrogen.

The strategy adopted to achieve the desired study outcomes included:

- Utilise current and previous study and other materials to streamline the approach to the feasibility study
- Selectively engage expert consultants for key scopes that target their areas of expertise and market credibility
- Actively manage and coordinate consultant scope packages for use in Feasibility Study Report
- Key focus on tight management of consultants with defined scopes to manage schedule and budget
- Utilise JT Feasibility Study Standard as basis of Feasibility Study structure
- Integrated team between EQR and JT to deliver Feasibility Study
- Feasibility Study Key Personnel:

- Kevin MacNeill – Study Owner
- Steve Jukes – Study Sponsor
- Peter Jukes – Study Manager
- Tony Bainbridge – Geology and Resources
- Ryan MacNeill – Economic Analysis

- Key personnel supported by range of additional EQR and JT resources

The expert consultants selectively engaged are included in Figure 5.

Figure 5: Feasibility Study Expert Consultants

1.5. Environment Social Governance (ESG)

1.5.1. Current Perspective

ESG has grown in prominence thanks to capital investment pressures, heightened consumer and stakeholder expectations, and global regulatory pressures for greater ESG reporting disclosures. Underpinning this is the broad realisation that its relevance in not only about addressing climate change, but also providing organisational long-term performance insights, both operationally and financially. ESG is not a separate business strategy, but the application of shared values and principles that realise commercial benefit whilst achieving positive social and environmental outcomes.

1.5.2. ESG Maturity

EQR appreciates the opportunities that an ESG focus can provide. As a resource efficient, value-oriented and resource critical mining company of the future, EQR has already aligned its purpose, mission, and values with some high level ESG objectives. The Company aims to contribute to sustainable development and align to United Nations Sustainable Development Goals, refer Table 2.

EQR defines their ESG adoption profile as an ‘early adopter’. Existing ESG environmental initiatives include:

- The implementation of a new waste sorting technology;
- A review of pollution prevention treatment options; and
- Ongoing participation in a pilot greenhouse gas (GHG) emissions tracking scheme in partnership with the University of Queensland.

They also have several ‘S’ centric employee attraction and retention programs underway centering on improving employee diversity and capability within the organisation. Additionally, EQR sponsor a range of community programs and events, engaging regularly and collaboratively with the community to develop initiatives that positively impact employees and the local community.

Table 2: EQR ESG Alignment with United Nations Sustainable Development Goals (SDG)

ESG Framework SDG Alignment		
Environment	We are committed to embedding and embracing resource efficiency in our operations. As a producer of a new economy critical mineral, we aim to minimize our impacts on the environment and prevent degradation through the optimal extraction of tungsten from a secondary source and through the integration of advanced processing technology.	
Social	Safety is a core value and a strategic priority, and we are committed to promoting and enhancing a safety culture in our operations. Our commitment to society includes promoting workforce diversity and inclusion, empowering local communities through creating employment opportunities, sourcing materials locally where possible and investing in our employees and communities for social development.	
Governance	As a value-oriented resources company, we are committed to acting in a transparent, accountable, and responsible manner in all our business dealings and operations.	

Through active engagement with local communities, environmental experts, and supply chains, EQR is building solid credentials for the future. Underpinning a philosophy of pragmatism and effectiveness, EQR has taken a multi-process approach including:

- Working sessions with the Leadership Team on purpose, core values and key principles;
- Revision of the Risk Management Policy; and
- The completion of an independent ESG Stakeholder Sentiment Survey and ESG status report.

1.5.3. Stakeholder Sentiment

An ESG Stakeholder Sentiment Survey was disseminated to 22 EQR stakeholders, with 19 respondents. The survey consisted of 56 questions and took approximately 10 minutes to complete.

Survey questions were broken into 12 themes aligning to the three Environment, Social, and Governance pillars. The purpose of the survey was to gather information on which ESG themes that stakeholders felt are of material importance to EQR.

Survey respondents were a mix of internal and external stakeholders including representation from the senior leadership team, shareholders, employees as well as external stakeholders such as local community members, suppliers, and financial service providers.

Stakeholders were asked to rate whether the organisation was perceived to be leading or lagging across each of the 12 ESG themes. They were asked to do this for both the current state of the business, as well as for where they felt the organisation should be positioned / aiming to be.

The results are in included in Figure 6.

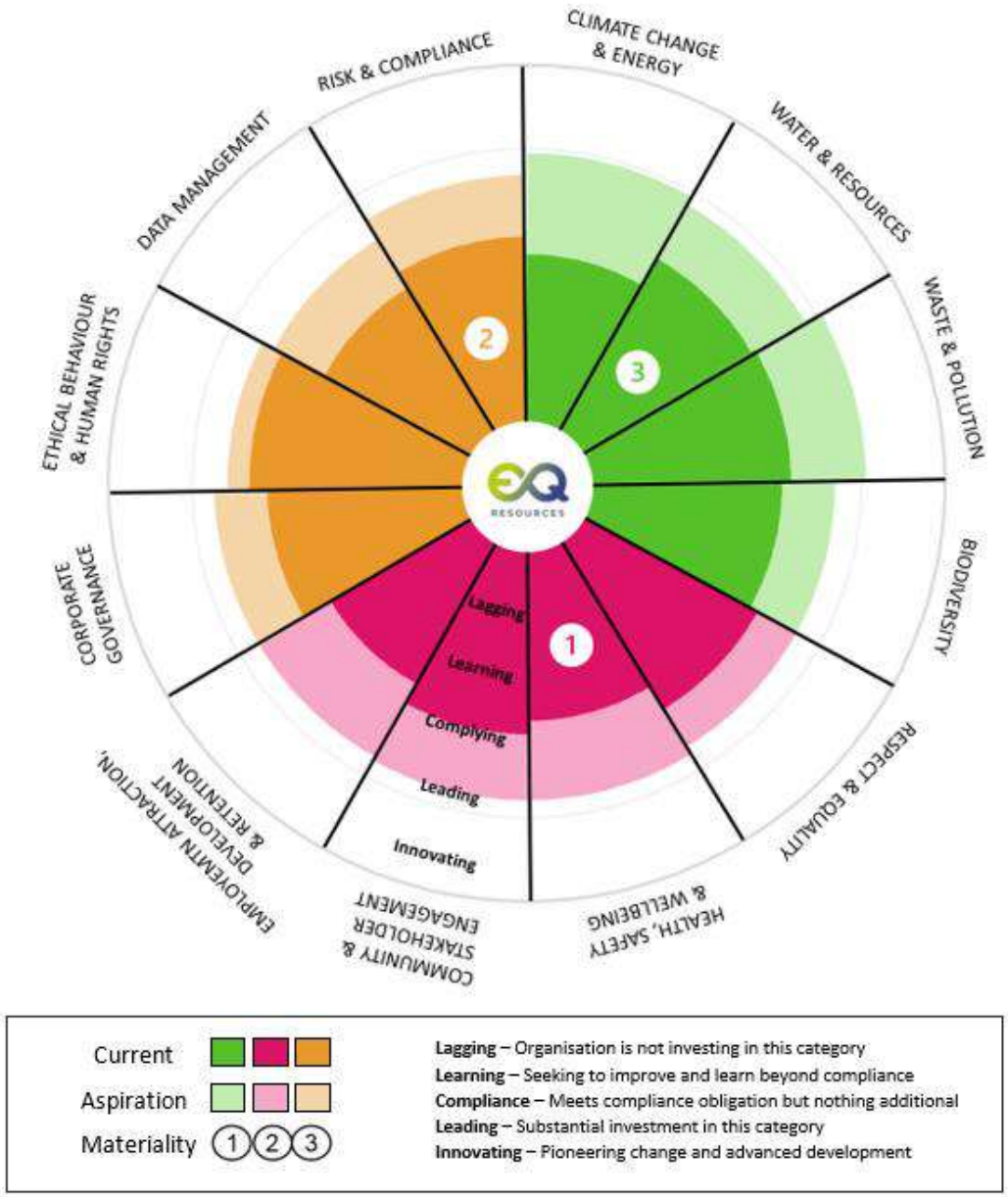


Figure 6: Stakeholder Sentiment and Materiality Survey Summary

1.5.4. Material Themes

Across the EQR leadership team and stakeholders surveyed, shared perceptions and aspirational goals were prevalent. The close alignment between stakeholder feedback and current ESG positioning and intentions reinforces EQR's high degree of confidence in its evolving ESG program. Multiple threads were identified, with five material themes highlighted:

- Employee and contractor health, safety, and wellness (Social);
- Proactive management of risk and compliance management (Governance);
- Creation of meaningful jobs and the creation of local talent pipelines (Social);
- Water, energy, and resources management and efficiency (Environmental); and
- Commitment to the accelerated transition to a low carbon future (Environmental).

Societal Challenges:

When applying a societal lens, additional opportunities were uncovered, including:

- Reducing site environmental impacts especially noise and dust;
- Reduce, recycle or repurposing waste;
- Provide local and regional employment especially for disadvantaged and minority groups;
- Maximise the opportunity for female participation in non-traditional work areas (currently at 25%);
- Stimulate a sustainable local supply chain including accommodation and essential services; and
- Support community health, wellbeing and resilience through sponsorships and volunteer work.

Strategic Positioning:

The outputs from the leadership workshops and a sentiment survey provided both insight and foresight. Recognising that ESG is a tightly intertwined series of process and practices across all business operations, EQR has adopted the following approach:

- Be an early adopter of 'Environmental' opportunities using technology and robust systems that deliver highly efficient extraction processes, minimising its physical footprint, developing low carbon operations, and minimising waste and consumables such as water, energy, explosives;
- Lead across a range of 'Social' opportunities especially, supporting sustainable communities and local supply chains, driving diversity and inclusion, preferencing local employment and developing a long-term pipeline of regional talent; and
- Deliver transparency and compliance regarding 'Governance', reporting and public disclosures, recognising that compliance is the floor not the ceiling of its obligations.

1.5.5. Strategic Direction

An ESG focus affords the Mt Carbine mine with significant opportunities to maximise positive environmental and social impacts both now and into the future. The EQR leadership team are committed to advancing their current ESG program with material consideration being given to both immediate opportunities and those longer term. From prospects for employment and industry expansion created within the local community, to the potential for a development of green energy via solar powered farms on rehabilitated stockpile and tailing areas, there are many areas under consideration for future incorporation.

Insight into current stakeholder priorities and suggestions will shape the future direction of the EQ Resources ESG program, with a particular focus on further developing a robust ESG framework that delivers environmental and social benefit with a positive and sustainable commercial return.

2. Strategy and Market Analysis

2.1. EQR Business Framework

EQR is focusing on being a low-impact miner through utilisation of advanced technologies, re-using historical mine footprints and creating beneficial reuse through the final waste materials produced. Mt Carbine has both a mineralised stockpile on surface that is tungsten bearing as well as a historic open pit that has been defined to have an accessible high-grade ore body. The focus of EQR currently is on the Mt Carbine Project to maximise value from the resource, while minimising the Company's environmental footprint and creating value for shareholders.

The Mt Carbine Project will benefit the wider minerals sector in Australia through alignment with the priority agenda of the Australian Government to expand its critical minerals industry and enhance the capabilities with regards to mine waste management and social licence to operate. EQR remains committed to responsible mining and sustainability with the aim to proactively minimise waste though reprocessing and innovative re-use of waste materials to generate a new, sustainable supply of (critical) minerals.

2.2. Product Specification

Based on the Off-take Agreement in place between CRONIMET Australia Pty Ltd, CRONIMET Asia Pte Ltd and Mt Carbine Retreatment Pty Ltd (a wholly owned subsidiary of EQR) in 2019, the specifications for tungsten concentrate are provided in Table 3. Further details of the ownership structure between EQR and CRONIMET are provided in Chapter 15: Ownership, Legal and Contractual.

Table 3: Tungsten Concentrate Specifications

Name of Element	Specification
WO_3	50% min
S	1.5% max
Sn	0.50% max
Mo	0.40% max
Sb	1.0% max
As	0.15% max
H_2O	1.0% max
Radioactivity: ≤1,000 bq/kg	

These specifications are in line with the overall market requirements for tungsten concentrate and shall remain applicable on the new products being defined in the frame of this feasibility study.

It must be noted that unlike what was considered in the Off-take Agreement, the feasibility study is now considering two separate products, a scheelite concentrate, and a wolframite concentrate, with the latter expected to be of suitable quality for further processing into ferrotungsten. The feasibility study is also including an arsenic removal circuit to ensure compliance with the arsenic specification.

This leads to additional, more stringent requirements applicable only on the wolframite product which are provided in Table 4.

Table 4: Wolframite Concentrate Specifications

Name of Element	Specification
Sn	0.30% max
Mo	0.30% max
P	0.05% max

2.3. Market Fundamentals

Market supply and demand forecasts are based on data provided by Roskill, a subsidiary of Wood Mackenzie. Further details can be found in EQ Resources Tungsten Market Report included in Chapter 2: Strategy and Market Analysis.

Disclaimer: *"The data and information provided by Roskill should not be interpreted as advice and you should not rely on it for any purpose. You may not copy or use this data and information except as expressly permitted by Roskill in writing. To the fullest extent permitted by law, Roskill accepts no responsibility for your use of this data and information"*

2.3.1. Tungsten Concentrate

Most tungsten concentrate supply, and a large proportion of secondary tungsten, is converted into ammonium paratungstate (APT). APT production is estimated at 102.7kt contained tungsten (W) in 2020, with the bulk of this produced by China. APT production is more concentrated than mine supply, with only a handful of major smelters active in the ex-China market.

Very little APT is consumed directly in end-use applications. Instead, it is used as feedstock for the production of other refined tungsten products, but mainly serves as feedstock for tungsten oxide – which itself is then converted to tungsten metal powder, and finally into tungsten carbide. Tungsten carbide is the main raw material used in cemented carbide tools.

The other major market for tungsten concentrates (and to a lesser extent, scrap) is in the production of ferrotungsten. Ferrotungsten is a master alloy used in the production of tungsten-containing steels, including tool steels such as high-speed steel. Raw materials used are high-grade ore or concentrates of wolframite or scheelite but artificial scheelite or soft scrap can also be used. Tungsten trioxide in these compounds can be reduced either carbothermically in electric arc furnaces or metallothermically with silicon and/or aluminium. A mixed carbothermic-silicothermic production method is also used. Commercial ferrotungsten contains 75-85% W.

2.3.2. Demand

Cemented carbides make up more than half of the first-use consumption of tungsten demand. Cemented carbides then form the major component of the top three end-use sectors:

- Automotive;
- Industrial; and
- Mining & Construction

China is the major tungsten demand centre, accounting for just under half of global demand currently and for the remainder of the forecast. Europe and the US are the next largest demand regions, with both expected to grow demand over the coming decade.

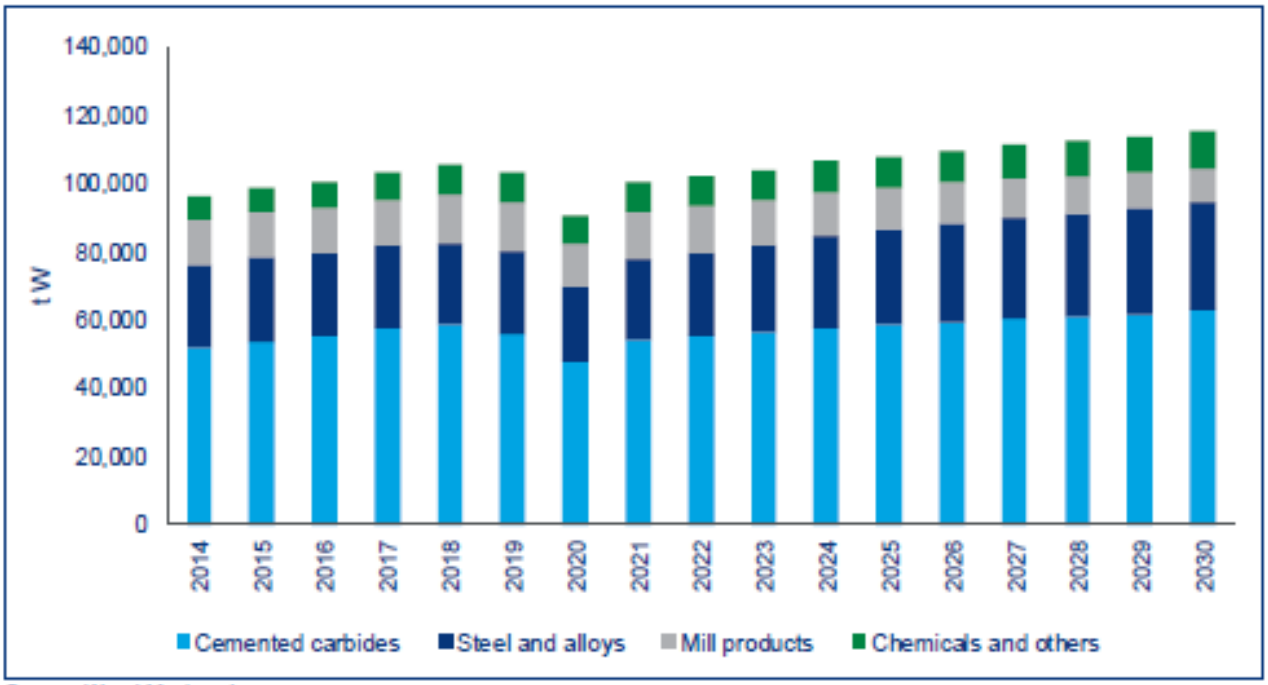
First-use Demand

Cemented carbides are the largest first-use market for tungsten, accounting for 53% of tungsten consumption in 2020. Cemented carbide consumption peaked in 2018 at 58.6 kt contained W. Cemented carbide tools are

used across a wide range of manufacturing industries and their demand growth correlates closely to GDP, and major consumer markets such as automotive output.

The other leading first-uses for tungsten are steel and alloys (24% in 2020), mill products (such as tungsten wire for lamps; 14% in 2020), and chemicals (including catalysts, and tungsten hexafluoride) which is combined with other uses to account for the remaining consumption (9% in 2020).

A decline in cemented carbide consumption, combined with declining steel and alloys consumption resulted in an overall decline in tungsten demand of 0.9% CAGR between 2014 and 2020. However, growth is forecast to return from 2021. Cemented carbides will also improve its share of overall demand, reaching 55% by 2030. The first-use consumption by product types is shown in Figure 7.



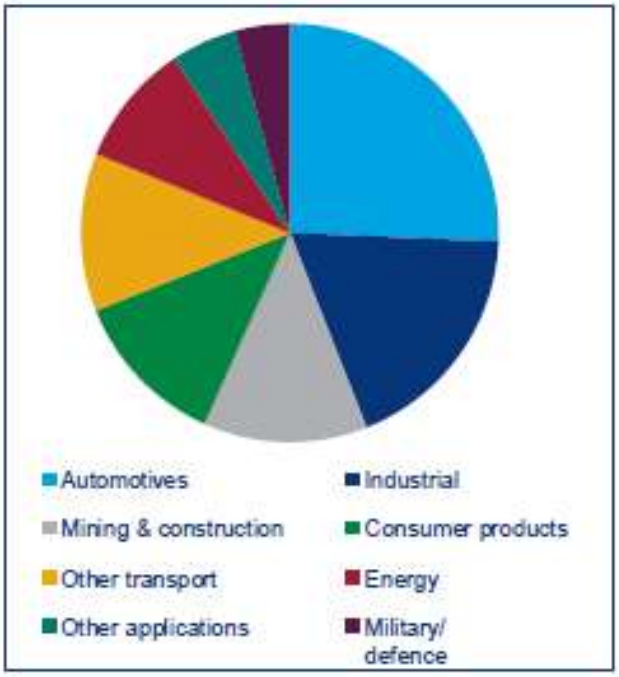
Source: Wood Mackenzie

Figure 7: First-use Consumption

End-use Demand

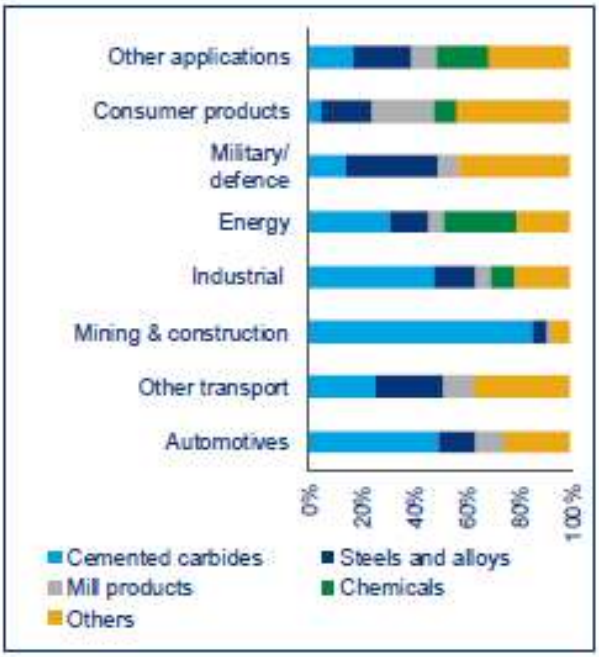
The consumption of tungsten by end-use in 2020 is illustrated in Figure 8. The automotive market was the largest end-use sector for tungsten in 2020 at 26% of the total, mainly in the form of cemented carbide tools for machining vehicle components. Industrial applications were the next largest segment at 18%. Other transport, mining & construction, and consumer goods combine to form 37% of demand, each consumed around 11-12 kt W in 2020.

Figure 9 shows additional detail of the proportion of first-use products in each end-use demand sector for 2020.



Source: Wood Mackenzie

Figure 8: End-use Sector Consumption (2020)



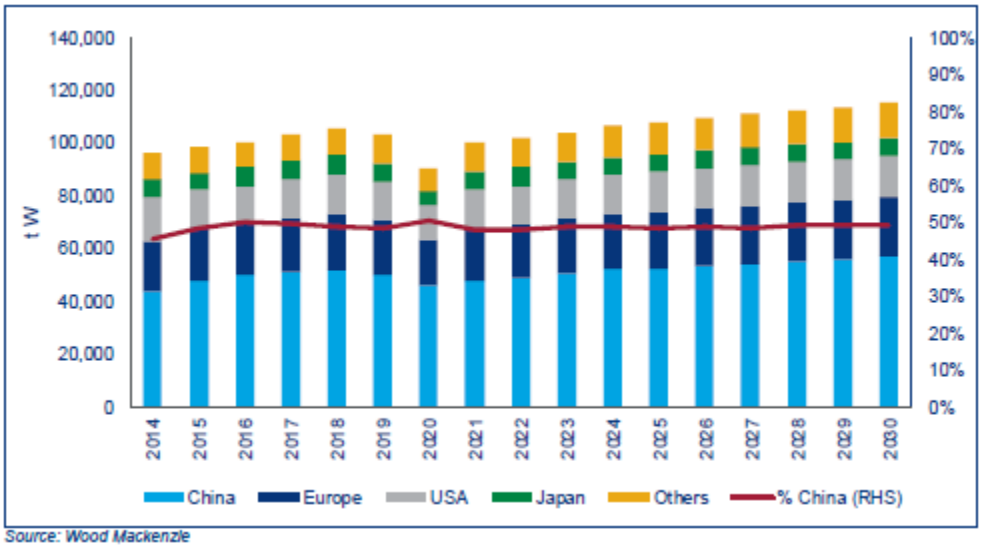
Source: Wood Mackenzie

Figure 9: First-use Product Consumption by Sector

Demand by Region

Global demand has been dominated by China in recent years. From 2014-2020, China accounted for just under half of global demand in most years except for 2017 and 2020 where demand surpassed 50% by a small margin. For the period 2021-2030 China is expected to maintain its dominant position with around 49% of

global demand in each year. Other major demand centers are Europe (19% of global demand in 2020), United States (14% of global demand in 2020), and Japan (6% of global demand in 2020). The demand per region is shown in Figure 10.



Source: Wood Mackenzie

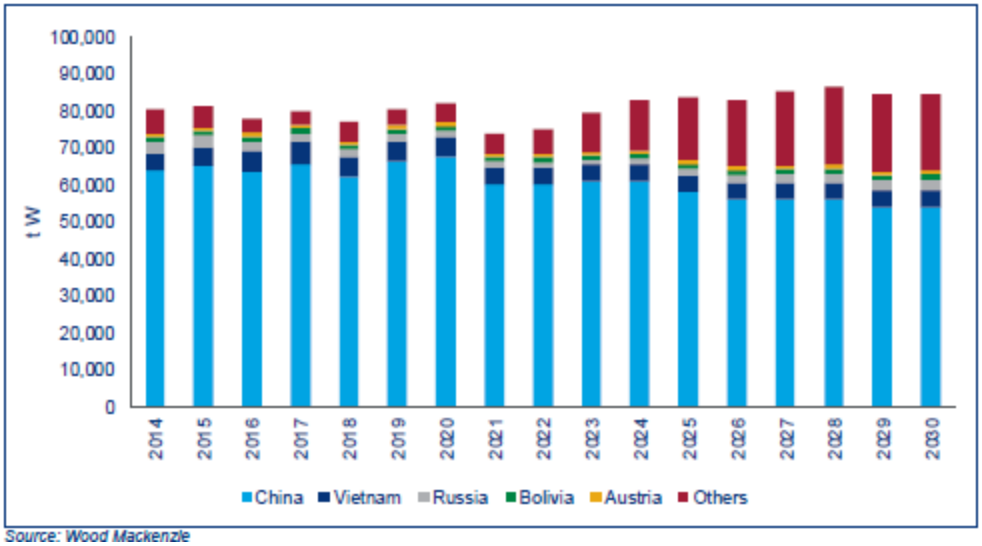
Figure 10: Demand by Region

2.3.3. Supply

Most tungsten is mined as a primary or co-product metal, and in lower volumes as a by-product. World mine production has remained relatively stable across this period between 2014 and 2020, with moderate drops in 2016 and 2018. The period between 2014 and 2020 marks substantially higher annual production than across earlier years. This was initially supported by a period of historically high APT prices, which themselves were at least partially driven by the failed Fanya Metal Exchange in Kunming, China, which traded APT.

Mine supply in 2019 recovered as a result of strong output from Chinese mines, despite reduced demand, depleting mine grades in Russia and Vietnam, and the mothballing or closure of other assets (Mongolia and the UK). In 2020, mine supply has risen again to historic highs, despite the impacts of COVID-19. Chinese output is again the principal contributor to this, with record production levels. Much of this increase to Chinese output is estimated to have been driven by strong tungsten by-product production, with many tungsten-only focused mines suffering from depleting grades.

Global mine production of tungsten by country is shown in Figure 11.



Source: Wood Mackenzie

Figure 11: Global Mine Production

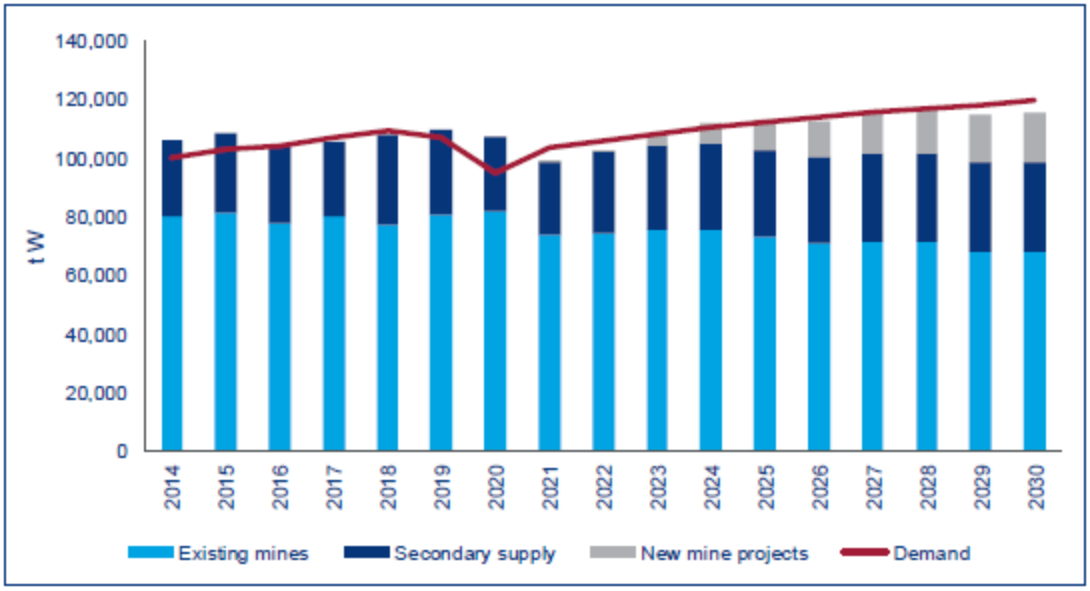
In 2014, production of concentrates outside China accounted for 20% of global supply, which by 2019 had dropped to 17%. In recent years Vietnam has become an increasingly important supplier, albeit for domestic consumption, following the start-up of the Nui Phao operation in 2014. It is now the second-largest producer globally, accounting for 5.4kt W in 2020. Other important non-Chinese tungsten producers include Russia, Bolivia, North Korea, Spain and Portugal.

2.4. Market History and Opportunities

The global tungsten market was in surplus in 2020 for the second successive year. This can be attributed to a sharp decline in demand in 2020, largely as a result of the impacts of the COVID-19 pandemic. Global consumption in 2020 fell by 11.3% year-on-year. Despite record mine output in 2020, primarily from a strong Chinese production, low availability of secondary material led to the lowest total supply levels since 2012.

However, low total supply only partially offset the sharp decline in demand. Consumption fell to its lowest level since 2010 and far below total supply for the year. The surplus supply of 12.5kt is the highest surplus level overhanging the market since 2013, when the now-defunct Fanya Metals Exchange was operational and tungsten prices were at record levels.

Historic and forecast supply and demand for tungsten is shown in Figure 12.



Source: Wood Mackenzie

Figure 12: Market Balance

While annual tungsten supply and demand has returned to surplus in recent years, it had been in deficit for several years after the collapse of the Fanya Metals Exchange. Prior to this the market had remained sufficiently supplied owing to the drawdown of stocks. In the 2013-2015 period there was substantial oversupply of tungsten into the market, which was linked to artificial demand from the Fanya Metals Exchange.

With the exception of the ex-Fanya APT stockpile held by China Molybdenum Co Ltd (CMOC), there is little inventory in the upstream portion of the tungsten supply chain as of Q1 2021. Most industry stocks are thought to be in the form of tungsten metal, tungsten carbide and finished tungsten products, with much of this residing in China.

A deficit of around 5.1kt W is expected in 2021, which may be partly met by CMOC's APT stocks, US DNSC concentrate stocks, and the drawdown of finished product inventories. The deficit is forecast to reduce and swing to a marginal surplus in 2023 as mine output from existing producers increases. Several large new Projects came online in 2019 and suffered delays to ramping up in 2020/2021 as a result of COVID-19.

Further ramping up is set to continue through 2022 and will replace the fall in output from longer established mines. New mine Projects will be able to meet the market supply requirements through the middle of the 2020s but will begin to fall short towards the end of the forecast. By 2029 new mine supply may not cover demand which is again likely to underpin higher prices.

2.5. Supply Strategy

Mt Carbine is exceptionally well positioned to supply tungsten concentrates into the market after the successful completion of pilot operations, trials, optimisations, and the recent drilling program. It now has the proven capability of producing tungsten from the resources at Mt Carbine on a low-cost basis.

Through site-based pilot-scale operations, focusing initially on the historic LGS, the aim was to prove the economic viability of mine waste retreatment by recovering industry-critical tungsten minerals. A geometallurgical approach to characterising mine waste materials was undertaken since it has significant benefits for evaluating and quantifying resource potential at historical sites. This was coupled to sensor-based particle sorting whose recent advancements in technologies made a significant step-change possible for the mining sector through the development and site-specific optimisation of a flexible and cost-efficient material handling and sorting solution.

Ore sorting at Mt Carbine was key to the early restart and cashflow generation of the mine. The use of XRT sorting on the ore at Mt Carbine reduces the volume of non-mineralised material entering the downstream

processing stream. This reduction positively impacts the economics of the Project and simultaneously reduces the capital footprint of the processing plant whilst producing a quarry aggregate product through the inert sorter waste products produced.

2.6. Market Value Assessment

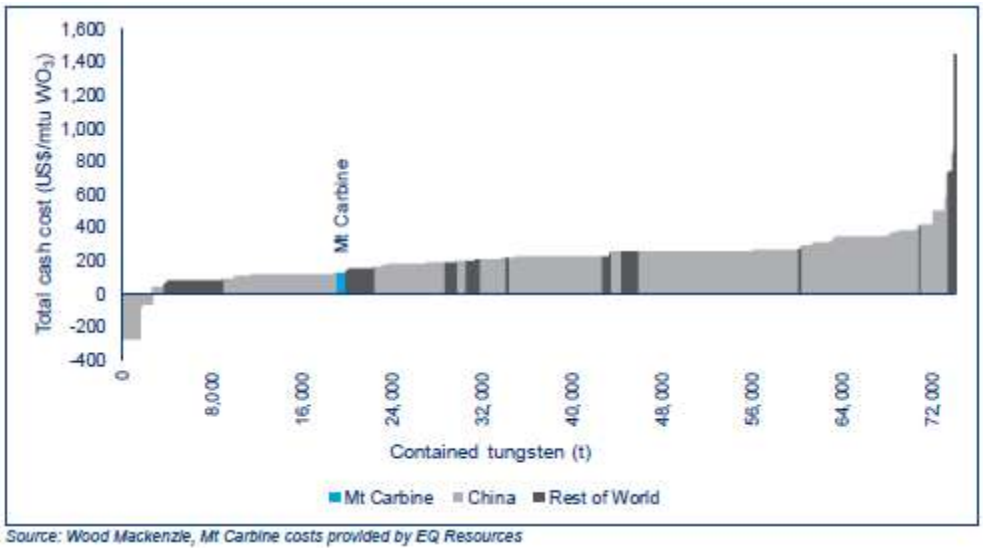
EQR developed a market value model as a basis for revenue modelling for the Project. The model was informed by the current contractual elements that are in place for the sale of concentrate from the Mt Carbine site as well as considering end-user purchase prices as known to EQR.

Market value modelling was then developed to adjust the baseline reference prices to reflect the value of Mt Carbine products in the global market. The parameters selected for price adjustments were:

- Base Price: Calculated on a metric tonne unit (MTU) of WO_3 contained in a dry metric tonne delivered FCA Mt Carbine (INCOTERMS 2010);
- Index: London Metal Bulletin (LMB) European APT;
- Pricing: Low and High European APT averaged for the calendar month of delivery for the tungsten concentrate;
- APT payable: A floating payable is considered, covering the period under the fixed off-take contract with CRONIMET and for the period afterwards;
- Payment terms: 95% payment upon delivery of product and 5% balance payment upon final settlement based on weighing and assay results.

2.7. Cost Curve Analysis

The Mt Carbine mine is a low-cost operation, with total cash costs (including royalties, but excluding potential by-product sale of processing waste through the quarry) well below global average. It is also forecasted to be one of the lowest cost "tungsten-only" producing mine, with most of the first quartile suppliers producing tungsten as a by-product of another metal, which is particularly notable for the first two producers which are reporting a negative production cost for their tungsten. The cost curve for the total cash cost of tungsten including Mt Carbine's position is shown in Figure 13.



Source: Wood Mackenzie, Mt Carbine costs provided by EQ Resources

Figure 13: Total Cash Cost Curve - 2020

It must be noted from the above cash cost curve that in order to sustain the growing demand, and despite the new projects expected to come online over the coming years, prices will have to remain at levels which incentivises production of the third, and even likely the fourth quartile suppliers, which will in addition face in

future higher costs due to falling ore grades. For Mt Carbine, this guarantees that its production cost will be well covered, and that significant margin shall be generated.

2.8. Pricing Basis and Forecast

2.8.1. Tungsten Concentrate

Tungsten concentrate prices are predominantly based on a discounted APT price, and thus followed similar trends to prices for APT.

Prices for tungsten concentrates have broadly followed the same trend as APT in recent years, although since 2015 the premium of APT over concentrates has reduced. This is believed to be because availability of concentrates has become tighter, particularly in the ex-China market. In 2018, the premium widened again, suggesting adequate supply of feedstocks – in this case, likely representing greater volumes of scrap onto the market. In 2019 and 2020, the premium of APT over concentrates once again generally reduced, with some temporary upticks, as availability of concentrates tightened once more in tandem with falling mine production.

Historical pricing for WO_3 concentrate is provided in Figure 14.

Figure 14: Chinese Tungsten Concentrate Prices

2.8.2. Forecast APT Prices

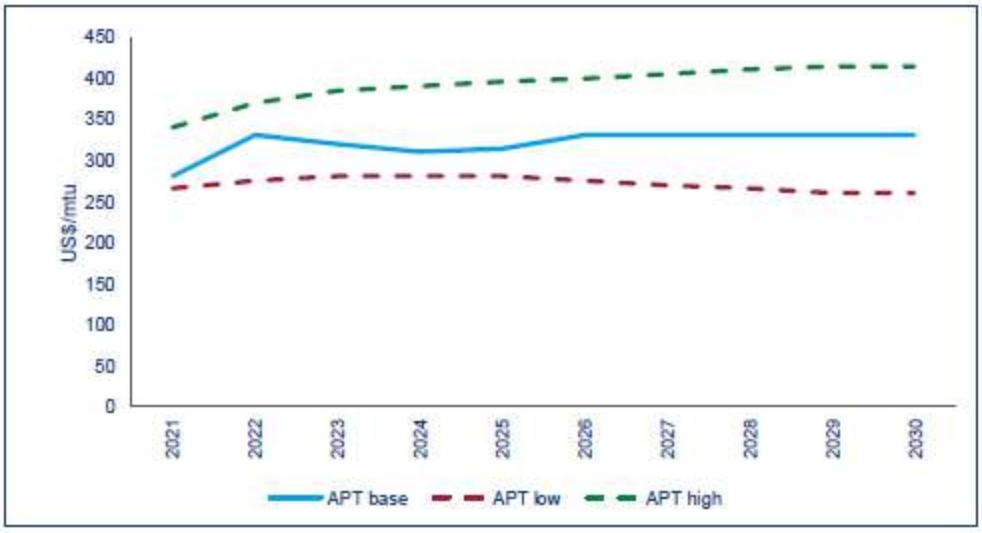
The range of factors contributing to APT prices means that forecasts for future prices are best examined under several scenarios. In the base case scenario, it is assumed that a deficit does occur in the early 2020s, as demand recovers and spikes after several years of decline, but that this is partly offset by either the continuation of CMOC's release of the Fanya APT stocks, by consumption of existing finished product inventories, or by new mine supply ramping up earlier than expected. As new mine projects come online however, the market is likely to move into balance during the mid-2020s. Towards the end of the forecast period, new mine supply may not cover demand, likely providing an upside driver to prices.

In the low-case scenario, a combination of factors may weigh down on the sector – such as the impacts of the COVID-19 pandemic leading to a sustained period of suppressed tungsten demand, a negative resolution to the US-China trade talks, or a higher penetration rate of electric vehicles than forecasted. New mine projects could also contribute to lower prices if more are successfully brought online than the market can sustain.

By contrast, the high-case scenario sees a deficit occurring in the early 2020s, which is not alleviated quickly enough by stocks or new mine projects. Furthermore, the high-case scenario makes a provision for Chinese environmental inspections occurring again in 2021-2022 when the market is already in a deficit. Prices would rise rapidly under these conditions, potentially exceeding US$370/mtu in 2022. If mine projects are not ramped

up as quickly as forecast, this could potentially see prices gain to US$385/mtu in 2023. This would, however, likely incentivise new production or greater scrap use, leading to a correction in the price in the mid-2020s.

The APT price forecast is shown in Figure 15.



Source: Wood Mackenzie

Figure 15: APT Price Forecasts

Note on Tungsten Concentrate Price Forecast

In consideration to the above-mentioned APT price forecast, it must be noted that the above discussed prices are all expressed in $/mtu in APT, where typically tungsten concentrate sells for about 75-77% of the APT price on a FCA basis. This payable factor varies with the product quality (WO_3 grade, but mostly impurities' levels), and its delivery term.

Given the range shown above, applying a 70-75% payable factor on the APT price forecast in the financial model has been deemed to be fair assumption of the tungsten concentrate price forecast.

2.9. Customers

Currently CRONIMET is the sole off-taker for the Project from the rights secured through early investment into the Mt Carbine Project. Since the start of the Project, concentrate has been sold to customers in Europe, the United States, Vietnam, and China.

While CRONIMET will retain a portion of the off-take at least equivalent to the existing deliveries, new off-takers might be considered as strategic project partners.

In addition, it has to be noted that CRONIMET has also a specific interest in off-taking part of the wolframite concentrate for its "in-house" conversion into ferrotungsten, which shall then be marketed to its existing steel clients.

Going forward, should CRONIMET no longer wish to trade the concentrates from the Mt Carbine operation, several other large commodity trading companies have verbally expressed interest in the concentrate being produced at Mt Carbine and therefore could be engaged if required.

3. Geology and Resources

The Mt Carbine mining area is confined within two Mining Leases (ML), ML4867 and ML 4919 totalling 366.39 hectares. The mining licenses are surrounded by EQR's Exploration Tenements (EPM) EPM 14872, EPM 14871 and EPM 27394 covering an additional 115 km^2.

A map of the tenure boundaries is shown in Figure 16.

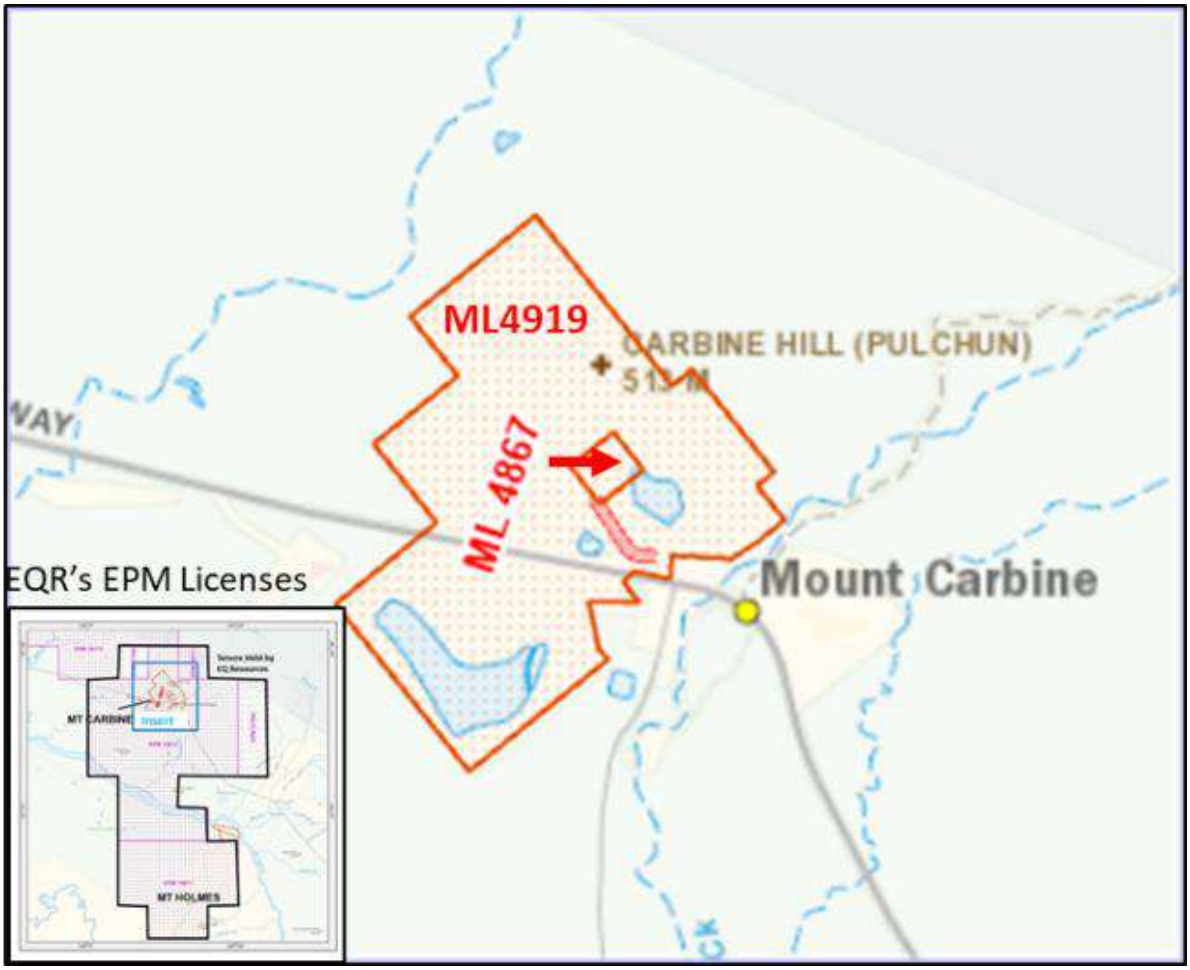


Figure 16: Mt Carbine Lease Boundaries and Surrounding Exploration Tenements

ML4867 (358.5 Ha) was first granted on 25 July 1974 and has been continually renewed until today. The latest renewal of 19 years expires on 31 July 2022, before which time EQR will submit a renewal application for a further 19 years. The renewal will be based on the new resource and completion of the Mt Carbine feasibility study outlining the planned future mining activity. ML4919 (7.891 Ha) was first granted on 24 August 1974 and has been continually renewed with the latest 19 year renewal expiring on 23 August 2023 and likewise a renewal application will be submitted in Q1, 2022.

3.1. Regional Geology

The Mt Carbine mine site is located within the Siluro-Devonian Hodgkinson sedimentary province. The thick sedimentary sequence was complexly folded and regionally metamorphosed prior to and during extensive granitic intrusions in the Carboniferous and Permian. The regional geology is shown in Figure 17.

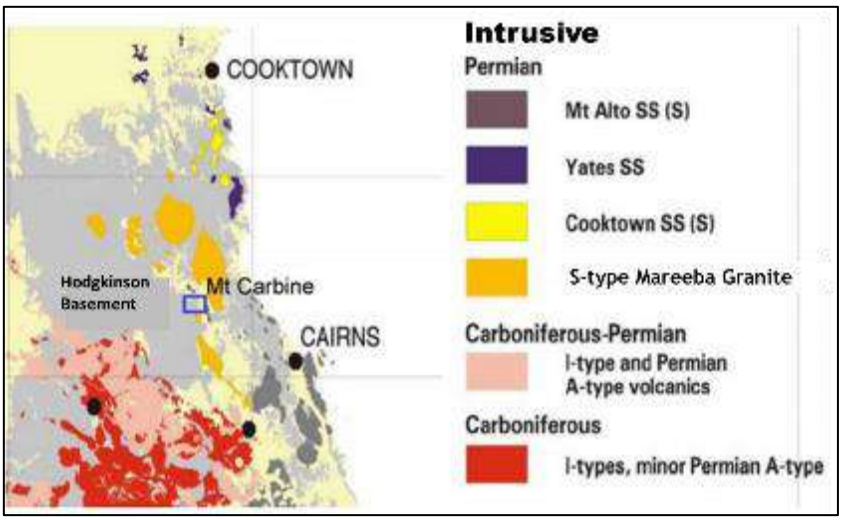


Figure 17: Regional Geological Setting of Mt Carbine

Within the permit north-north-west trending Hodgkinson Formation turbidite and siltstones are intruded by the Mareeba Granite dated at 277My, and the Mt Alto Granite, dated at 271±5My (Bultitude et al., 1999). Contact metamorphic aureoles marked by formation of cordierite Hornfels surround the granite intrusive and numerous acid to intermediate dykes intrude the metasediments. In the western portion of the tenement, a prominent metabasalt-chert ridge is a significant Hodgkinson formation stratigraphic component.

3.2. Mineralisation

The Mt Carbine tungsten deposit consists of a number of vertical to sub vertical sheeted quartz veins ranging in width up to 7m but averaging around 50cm. Only about 20% of the quartz veins are mineralised due to an early barren quartz event and a later high-grade quartz event. Economic minerals are the tungsten minerals of wolframite and scheelite mineralisation.

A typical section through the canter of the deposit has over 35 quartz veins ranging from 10cm to 6m in width with 5-8 zones of overprinting narrow mineralised quartz veins of 10-150cm in width. These high grade veins containing rich quartz - feldspar tungsten minerals and have been designated as “King Veins”.

The tungsten occurs as coarse crystalline varieties of Wolframite up to 10cm crystal size and with varying degrees of intergrown scheelite that is volumetrically less significant. Tungsten minerals can form up to 50% of the quartz vein zone, as intersected and with such coarse nature to the zones has potential to cause a nugget effect to the mineralisation. In later retrograde stages of the mineral deposition, a later scheelite overprinting event occurred that is represented mostly as fine scheelite fractures and replacement over wolframite.

The Scheelite-Wolframite ratio is seen to increase to the grid north and grid east of the deposit and this mostly appears to be a local effect due to the host rocks they are crossing becoming more calcareous. In general the veins are persistent and strong and cross all rock types and occur due to structural control.

Examples of mineralisation in core samples are shown in Figure 18 and Figure 19.

Figure 18: King Veins Showing Coarse Vein Textures of Wolframite Crystals

Figure 19: Core Showing Late Replacement of Wolframite by Fine Network Retrograde Scheelite

The mineralisation interpretation is that there are two primary mineralising events with the first phase being a pervasive gaseous front that forms broader scale silicification / veining and deposits a lower grade background level of tungsten mineralisation. A rich brine fluid then entered later through later fracturing of the now silicified host rock. These brine veins (king veins shown above) are recognised to have higher temperature and higher salinities in fluid inclusion work attesting to their direct magmatic origin. Conversely the gaseous veins result in fluid inclusions with more gases and a composition showing mixing with groundwater has occurred. The king veins can be as high as 50% WO_3 but typically are in the 1-2% WO_3 range.

Along the grid E-W strike to the mineralisation, the veins have been grouped into lenses, where one or more of the high-grade king veins are close enough to define a composite value above a cut off of 2m 0.25% WO_3.

An indicative cross section through the open pit indicating vein locations is shown in Figure 20.

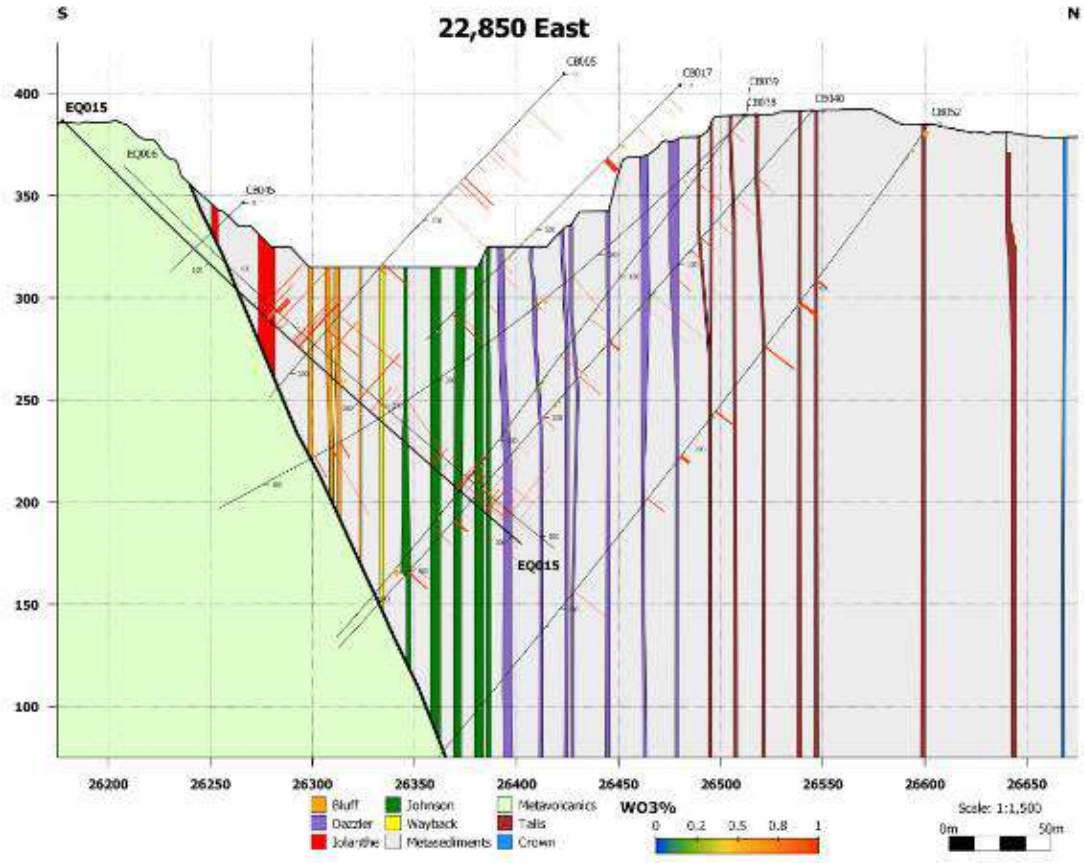


Figure 20: Typical Ore Section Through Open Pit

3.3. Resource Estimation

EQR engaged Brisbane-based consultancy, Measured Group, to complete the independent resource re-calculation. The re-assessment of the resource was seen as the priority and work was supported by a 2021 program of 4,074m of diamond drilling and a successful completion of a METS Ignited Grant funded trial operation campaign for the material from the LGS.

The revised in-situ hard-rock resource of 9.21 Mt at 0.63% WO_3 replaces the previous resource estimate published by Icon Resources Limited (by GeoSun, dated 2013). With the addition of the 12 Mt LGS grading at 0.075% WO_3, the total metal (in form of WO_3) contained is approximately 6.7 million metric tonne units (MTUs equal to 10 kg). This is detailed further in Section 3.3.

As seen in Figure 21, when compared to the historical Mt Carbine Geostat resource, the area covered is only 60% of the previous block model area. The model defines 2-12m wide tungsten lenses separated by barren waste zones in sufficient detail. With the tightening of the drill spacing, it allows the model to more clearly define the resources into higher grade narrower lenses.

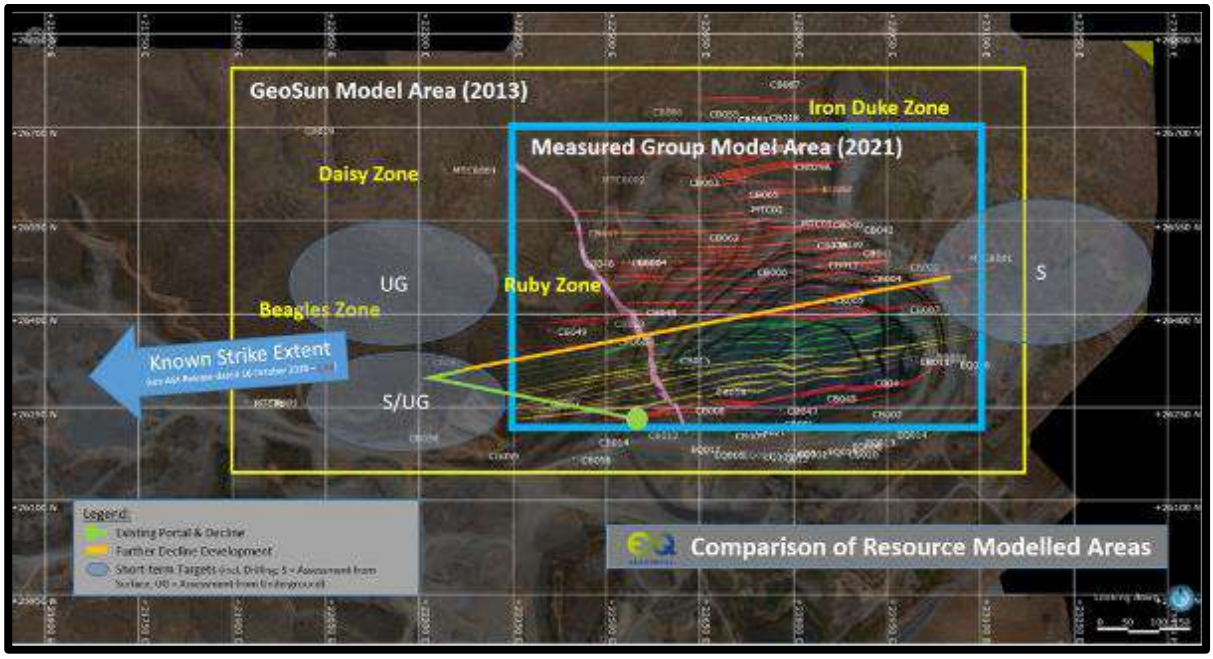


Figure 21: Current and Previous Resource Definition Areas

In Figure 21, the blue area outlines the current resource calculation area whilst the yellow reflects the GeoStat previous resource calculation. The green line represents the existing decline with orange indicating the historical extension plan. Grey areas are future drill targets with the strike extent of Mt Carbine open to the west and depth.

It was determined by Measured Group, drilling indicated mineralisation continues for up to a 1,300m strike and up to 600m in width. The limits of mineralisation have not been completely defined and are open at depth and along strike.

The resource estimation for the LGS and in-situ hard rock resources is summarised in Table 5.

Table 5: Mt Carbine Mineral Resource – September 2021

Classification	Tonnes (million)	Grade (% WO_3)	WO_3 (mtu)
Low Grade Stockpile			
Indicated	12.00	0.075	900,000
In-Situ Hard Rock Resources			
Indicated	2.40	0.74	1,776,000
Inferred	6.81	0.59	4,017,900
Sub-Total	**9.21**	**0.63**	**5,793,900**
Total Mt Carbine Mineral Resource			
	21.21		**6,693,900**

NOTES:

1. Total estimates are rounded to reflect confidence and resource categorisation.

2. Classification of Mineral Resources incorporates the terms and definitions from the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012) published by the Joint Ore Reserve Committee (JORC)

3. No upper cut was applied to individual assays for this resource, a lower cut of 0.25% WO_3 was applied

Most of the previously inferred resources around the open cut, have now been converted to indicated resources, and confidence was gained that further drilling will continue to also convert the inferred Iron Duke Zone into indicated resources.

4. Mining

4.1. Operational Overview

The Mt Carbine mine is a surface operation, with two sources of tungsten ore available – an in-situ opencut resource and a historical low-grade stockpile, locations as shown in Figure 22. Ore Reserves are 1.26Mt @ 0.71% WO_3 and 10.2Mt @ 0.075% WO_3 respectively.

Figure 22: OC and LGS Mining Limits

Extraction from both sources will be undertaken by conventional excavator and truck fleets. Selective ore mining practices will be employed in the in-situ open cut, with bulk ore mining of the LGS occurring due to local grade variability and lack of historical records.

Ore from both sources will be treated at a dry processing plant prior to concentrate production at the gravity plant. Through this process, ore grade to the gravity plant is significantly improved, with an associated reduction in mass.

The primary operational constraints are as follows:

- Processing plant capacity of ~408kt per annum;
- LGS regulatory approval limit of 1Mt mined per annum; and
- Mobile fleet capacity of ~6Mt per annum total material movement.

Based on these constraints a life of mine (LOM) schedule has been developed. Following regulatory approvals, a three-year contract mining operation of the in-situ reserves will be undertaken, with supplementary LGS feed via EQR mobile equipment. Upon depletion of the in-situ reserves, ore feed will revert solely to the LGS.

It is planned to commence underground mining to supplement the depletion of the open pit in-situ ore. This will be the subject of further study and is not considered in this mine schedule.

Table 6 includes the primary physical metrics of the LOM schedule.

Table 6: LOM Primary Physical Metrics

Variable	Unit	Annual Minimum	Annual Maximum	LOM
Total Mined Tonnes	t	786,000	5,999,000	25,201,000
Mined Ore Tonnes	t	783,000	1,006,000	11,384,000
Mined Waste Tonnes	t	26,700	5,129,000	13,816,000
Gravity Plant Feed	t	318,000	408,000	4,775,000
Gravity Plant Head Grade	%	0.18	1.17	0.33
Produced Concentrate	t	950	8,000	26,680

Mobile equipment required for mining operations will comprise two fleets:

- A primary fleet of 1x100-120t class excavator and five to six 50t articulated dump trucks. The focus of this fleet will be open cut (OC) waste movement and some LGS ore mining depending on scheduling; and
- A secondary fleet of 1x50-90t class excavator and 3x50t articulated dump trucks, focusing on OC ore recovery and LGS ore mining as required.

The operation will run on a 24hr, 7-day a week roster, with the exception of LGS load and haul requirements which will be day shift only. Mine management personnel will be on a standard 5-day work week.

4.2. Material Characterisation

Material to be extracted at Mt Carbine can be divided into two main lithologies – hornfels and metasediments. The weathered profile of the two rock types varies considerably, the hornfels is ~2-4 metres, whilst the metasediments have a deep (up to 30 metres) weathered profile, particularly adjacent to the South Wall and Iron Duke Faults. As such, weathered metasediments can be classified as a separate 'material type'.

Characteristics of the material types is detailed in Table 7.

Table 7: Material Characteristics

Material	Estimated Hardness	Unconfined Compressive Strength (MPa)	Insitu Density	Loose Density	Swell Factor (%)	Contaminants (PAF/NAF)	Comments
Hornfels	R4 to R5	62.5 to 91	2.74	2.28	20	No	
Metasediment	R3 to R4	4 to 91	2.74	2.28	20	Unknown	Likely to slake and desiccate based on field observations

The other material characteristic of note is the high quartz content of the tungsten bearing veins. The prevention of silicosis (a lung disease caused by inhaling large amounts of crystalline silica dust) has become a priority of QLD regulatory bodies and the operational management plan should include respirable dust controls. These controls could include specific drill and blast practices and dust suppression through water spraying.

4.3. Hydrogeology

A series of groundwater bores were drilled around the Mt Carbine local area in 2011, providing a good groundwater monitoring network for the mining operation. Sampling and analysis of the network was undertaken by hydrogeological consultants Rob Lait & Associates, with a report *"Report on Carbine Tungsten Groundwater Study"* delivered in December 2012.

The findings of the report are as follows:

- There is low hydraulic conductivity within the Hodgkinson Formation aquifers and minimal groundwater inflow is expected into the open cut pit.
- Testing of groundwater samples indicates the open cut pit water is better quality than the surrounding groundwater aquifers.

Based on these findings, groundwater is not considered a major risk from either a ground stability or contamination perspective and will be managed via a typical suite of operational controls – pumping, sediment settling dams, dilution, reuse, and approved discharge if necessary.

4.4. Geotechnical

The current pit excavation provides a good opportunity for understanding the future open cut geotechnical performance for the area. Additionally, the underground development has provided further insight into the rockmass condition and has several consultant investigations completed over the years. The previous work has developed a broad understanding, albeit over many decades, during which time changes in geotechnical data collection methodologies and evaluation techniques have evolved.

The geotechnical dataset supporting the basis of the open cut pit shell is as follows:

- RQD and defect information from 79 diamond drill holes across deposit;
- Two images and a powerpoint presentation of the above drill hole information; and
- Four geotechnical reports, entitled as follows:
    - GCPL – MC – 160421 – *Preliminary Geotechnical Assessment of Ground Conditions & Remedial Support (2021);*
    - HCOVGlobal – *Brief Review & Structural Assessment/Scoping of Iron Duke – Petersens – Mt Carbine EPM 14872 (2020);*

- Golder Associates – *Report to R.B Mining Pty. Ltd. On Mt Carbine Mine Review of Rock Mechanics (1984); and*
- HD042 – Piteau & Associates – *Slope Stability Analysis & Design of the Open Pit Slopes (1982).*

4.4.1. Current Data Evaluation

Defect and RQD logging of the 79 diamond drill holes (over 20,000 metres of core) was completed by EQ Resources geological personnel. The data was compiled into a three-dimensional model in Leapfrog software and corresponds well with historical fault, shear and fractured zones.

The majority of the fractures observed are associated with the South Wall Fault, being found in the 10-15m zone of foot wall. The South Wall Fault is well exposed in the existing pit and has over eighty intersections recorded in exploration drilling to date. It varies from 0.5 to 2.0m in thickness and is marked by a clay filled fault gouge.

Figure 23 illustrates the defect logging completed and alignment with historical defect mapping.

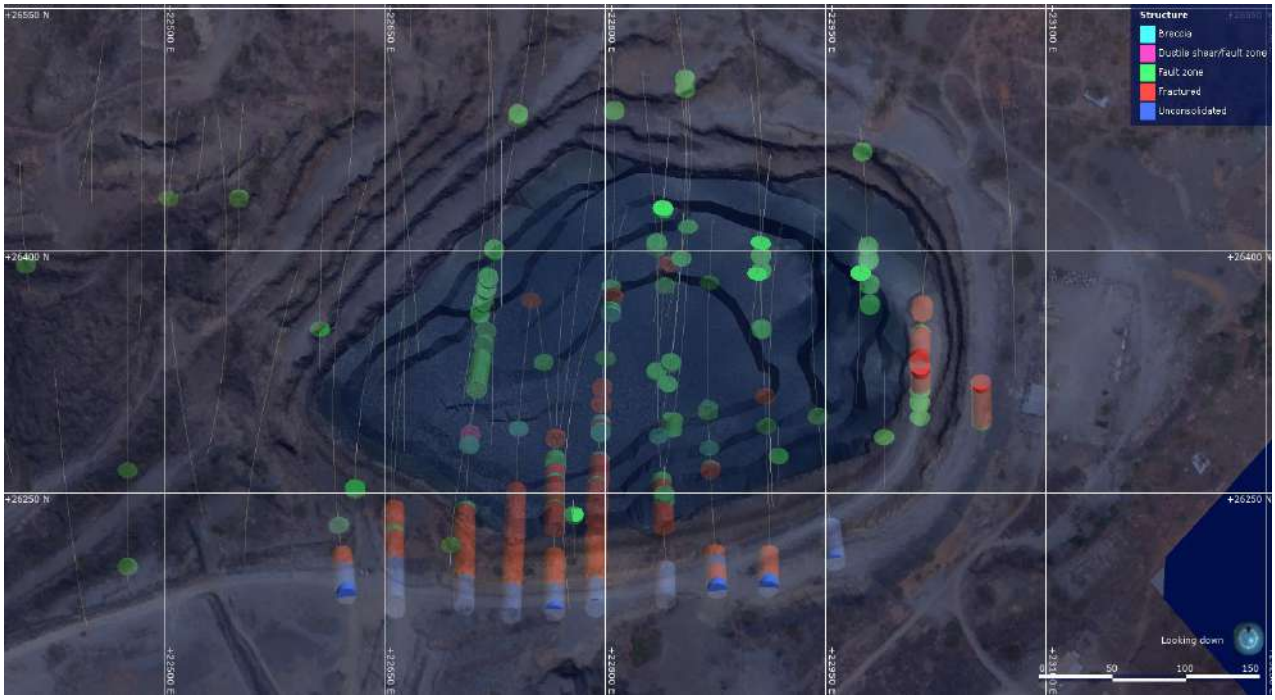


Figure 23: Defect Logging and Structural Model of Exploration Drill Holes (plan view)

4.4.2. Current Pit Design

Geotechnical parameters of the current pit design and ground stabilisation requirements are included in Table 8 and Table 9.

Table 8: Geotechnical Parameters of Open Cut Pit Design

Parameter	Value	Comment
Bench Height (m)	20	Suitable in hornfels material north of the South Wall Fault, see Table 9 for mechanical ground stabilisation requirements south of the fault.
Bench batter angle (^{0})	70	
Bench width (m)	8	
Ramp angle (%)	10	

Parameter	Value	Comment
Inter-ramp slope angle (^{0})	70	

Table 9: Ground Stabilisation Requirements for Southern Pit Wall

Toe Elevation (m)	Length of pit wall (m)	Area (m^2)	Horizontal Spacing	No. of Rows	Min. bolt length (m)	No. of bolts	Bolting metres (m)
380	261	2463	3	2	10	174	1740
360	491	9820	3	4	10	655	6547
340	453	9060	3	6	10	906	9060
320	413	8260	3	5	10	688	6883
300	349	6980	3	5	10	582	5817
280	333	6660	3	5	10	555	5550
260	270	5400	3	5	10	450	4500
240	211	4220	3	5	10	352	3517
220	51	1020	3	5	10	85	850
Total	**2832**	**53,883**				**4446**	**44,463**

The key element of the current pit design is the requirement for mechanical ground stabilisation on the southern wall, behind the South Wall Fault. The ground stabilisation is based off the work completed by Piteau (1982) and comprises the following:

- Horizontal groundwater drainage holes (up to 20m long) at the base of each bench, with associated drainage channel.
- Vertical 10m twin strand cable bolts, two rows at 3 metres spacing, above the 380RL.
- Inclined (-10^0) 10m twin strand cable bolts, four rows at 3 metres spacing, above the 360RL.
- Inclined (-10^0) 10m twin strand cable bolts, six rows at 3 metres spacing, above the 340RL
- Below the 340RL, 10m twin strand cable bolts, five rows at 3 metres spacing for all benches
- Cable bolt loading above the 340RL is 20 tonne, below the 340RL is 50 tonne.

4.5. Mine Production

A LOM mining schedule was developed on the existing Joint Ore Reserves Committee (JORC) Reserves from the LGS and in-situ orebody. The considerable inferred resources in the in-situ orebody were excluded from the schedule.

Key drivers for mining schedule development were:

- Utilising all the gravity plant annual capacity to realize maximum revenue for the project
- Optimising the volume and timing of high-grade ore from the in-situ orebody to the processing plant

A number of scenarios with ranged input variables were analysed to deliver an optimized LOM mining schedule.

The LOM schedule consists of three main components:

- One year of mining from the LGS, to allow for open cut regulatory approvals, infrastructure upgrades and mining contractor award and mobilisation.
- Three years of in-situ open cut mining to deplete the current JORC Reserves, with supplementary feed from the LGS to maximize gravity plant throughput.
- Approximately eight years of mining to deplete the remaining LGS reserves.

Key physical metrics are included in Table 10 and Figure 24 illustrates the mining sequence via four stage plans.

Due to the in-situ orebody shape (tungsten grade and width increasing with depth), the initial mining benches contain minimal ore and a resultant high strip ratio. Strip ratio balancing was achieved by extraction of a high-grade ore zone (HGZ) immediately below the historic pit floor (325-300RL), in conjunction with the larger pit development at higher elevations.

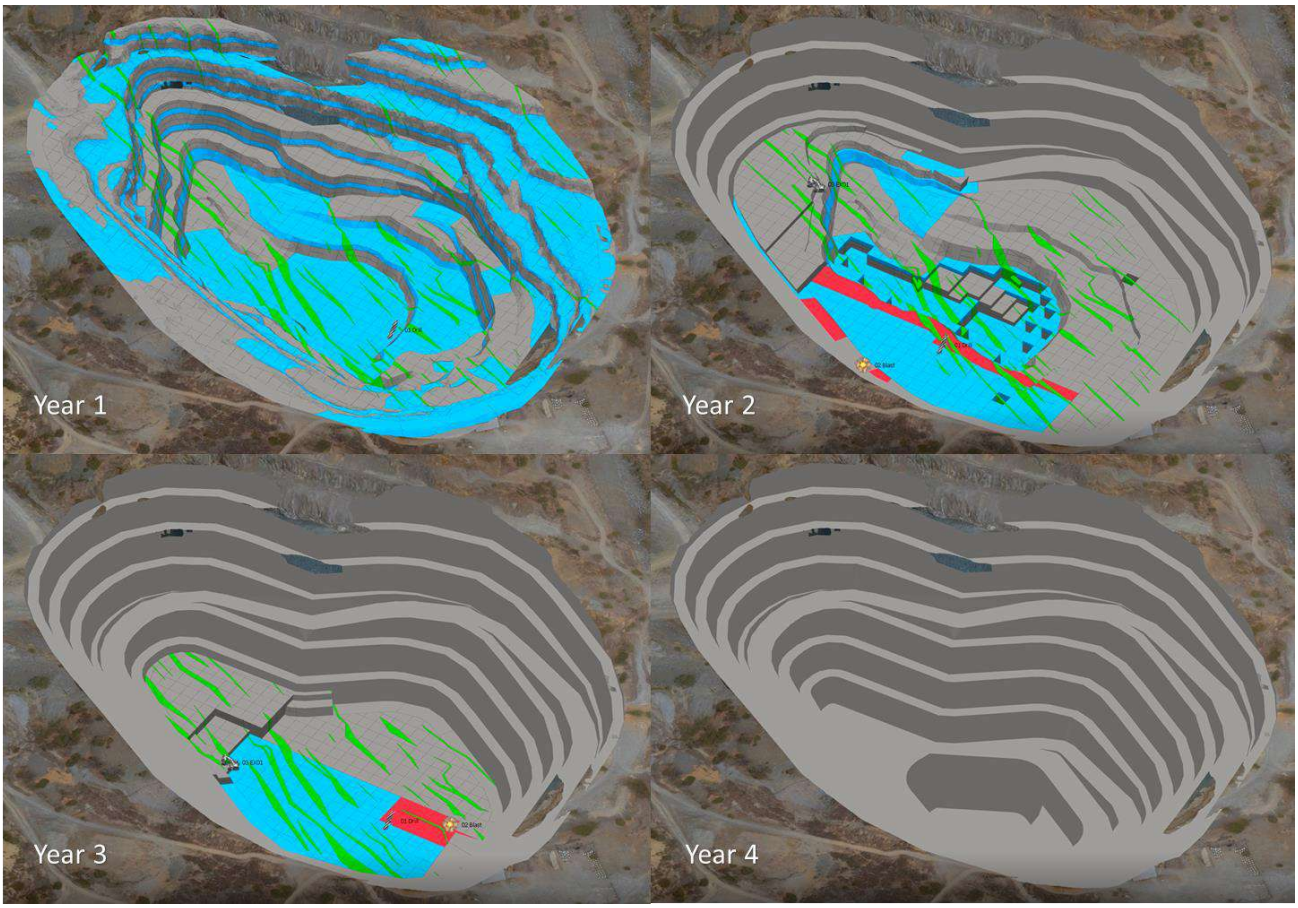


Figure 24: Open Cut Mining Stage Plans

Following early extraction of the HGZ, pit development adheres to a conventional top-down approach, with pit floor reached at 220RL.

Production scenarios were developed using Comet Strategy value optimisation software, with the main constraints being mobile fleet capacity, particle ore sorting capacity and gravity plant capacity. No constraint on the gravity plant head grade was applied.

As the open cut mining will potentially be a contract mining operation, particular emphasis was placed on delivering a schedule with consistent year-on-year physical metrics. Scenarios with varying mobile fleet capacities (4Mtpa, 5Mtpa, 6Mtpa) were scheduled and analysed against the following criteria:

- Overall project cashflow;

- Volume and year on year consistency of ore flow to the gravity plant; and
- Year on year consistency of total material movement.

The base case for equipment selection was the existing EQR mobile fleet of 90t excavator and 50t articulated dump trucks for the following reasons:

- Small footprint and good performance in tighter working areas;
- Utilisation flexibility between the LGS and open cut; and
- Simplification of fleet maintenance (and associated infrastructure) requirements.

Table 10: Key Physical Metrics

Variable	Unit	Annual Minimum	Annual Maximum	LOM
Total Mined Tonnes	t	786,000	5,999,000	25,201,000
Mined Ore Tonnes	t	783,000	1,006,000	11,384,000
Mined Waste Tonnes	t	26,700	5,129,000	13,816,000

The 6Mtpa mining scenario was chosen as it best met the assessment criteria of project cashflow, consistency of material movement and ore flow to the gravity plant. For open cut mining a contract fleet of approximately 4.5Mtpa capacity is recommended, with the EQR mobile fleet utilized for LGS and remaining open cut material movement requirements.

To achieve nameplate capacity at the processing plant, the productivity rates stated in Table 11 are required.

Table 11: Equipment Productivities

Component	Productivity rate per hour (t)	Operating hours (hr)	Annual capacity (t)
LGS Mining fleet	331	3024	1,000,000
OC Mining fleet	824	6048	5,000,000
Crushing & Screening	200	6804	1,500,000
Ore Sorting	120	6804	648,000
Gravity Plant	60	6804	408,000
Front End Loaders (2 units)	350	6048	2,110,000

4.6. Mining Method

Mining of both the LGS and open cut shall be performed using conventional excavator and truck operations. Similar sized fleets are utilised in both areas, providing flexibility for mine design, scheduling and operational execution.

Extraction from the LGS is a straightforward load and haul process. Mining will be completed by a 90t excavator working on four metres benches, with a fleet of Bell 50t articulated dump trucks hauling material to the dry processing plant.

Mining will be undertaken from top to bottom in the aforementioned four metre benches, commencing in the south-eastern section of the LGS and progressing to the north-west. As the LGS thickens, multiple benches will be excavated producing a conventional strip-mining arrangement.

Similarly, open cut mining will be undertaken in a standard drill and blast, load and haul configuration.

Loading of the articulated dump truck (ADT) fleet will be undertaken by a single 100-120 tonne excavator with a bucket capacity of at least 7.4m^3 (in excavator configuration). An example of this excavator class is the Liebherr R9100.

Bench geometry will be slightly smaller than the LGS, with a 4-metre height and minimum 20-metre width

Approximately 5.4 million tonnes of material require blasting in 2023 and 2024, tapering off to 4.4 million tonnes in 2025. To maintain sufficient blasted inventory, a minimum 100kt of blasted material is required on a weekly basis. Mining blocks will be a minimum 20x20x30 metres in size, equating to 12,000bcm or 33,000 tonnes. Accordingly, at least 3 blocks will be blasted weekly to maintain the required inventory.

5. Processing

5.1. Overview

The site processing infrastructure is split into two distinct areas on the site. Adjacent to the LGS is the crushing, screening and sorting area, where ROM material is screened and sized. +6,-40mm material is sorted using XRT sorting equipment where approximately 10% of the XRT sorter feed is then crushed and stockpiled for feeding into the processing plant. The remaining 90% of material is barren of tungsten and utilized as quarry material.

-6mm material and the XRT sorter concentrate are then trucked and fed into the processing plant located on the opposite side of the Mulligan Highway. The processing plant is dry fed and produces a tungsten product and waste tailings material.

The locations of the crushing, screening and sorting area, and processing area is shown in Figure 25.

The details of the current and future processing infrastructure is detailed further in Chapter 5: Processing.

Figure 25: Processing Infrastructure Locations

The scope of the processing infrastructure modernisation and expansion for each of the is split into two distinct phases, these are summarised below.

5.2. Crushing Screening and Sorting Area

5.2.1. Phase 1 Overview

The process design philosophy for Phase 1 for the crushing, screening and sorting plant was to achieve the following process outcomes for minimal capital expenditure requirements:

- Modify the existing crushing and screening infrastructure
- Increase ROM throughput to a nominal 170tph of -700mm material
- Introduce wet screening of -6mm material to improve screening efficiencies during the wet season
- Introduce direct process plant feed of -6mm material to reduce materials rehandling requirements

The Phase 1 crushing, screening and sorting circuits were designed in accordance with the design criteria in Table 12.

Table 12: Phase 1 Crushing, Screening and Sorting Design Criteria

Description	Criteria	Unit
General		
Ore Type	Dry and clean ore	
Ore Hardness	7	Mpa
Ore Abrasiveness	0.79	Ai
Maximum Lump Size	750	mm
Design Life	20	Years
Plant Size	1,000,000	tpa

The existing ore sorter circuit will be utilised for Phase 1. The existing ore sorter is shown in Figure 26.

Figure 26: Existing Ore Sorter

The Phase 1 modifications for the crushing, screening and rehandling circuits are shown in Figure 27 and Figure 28.

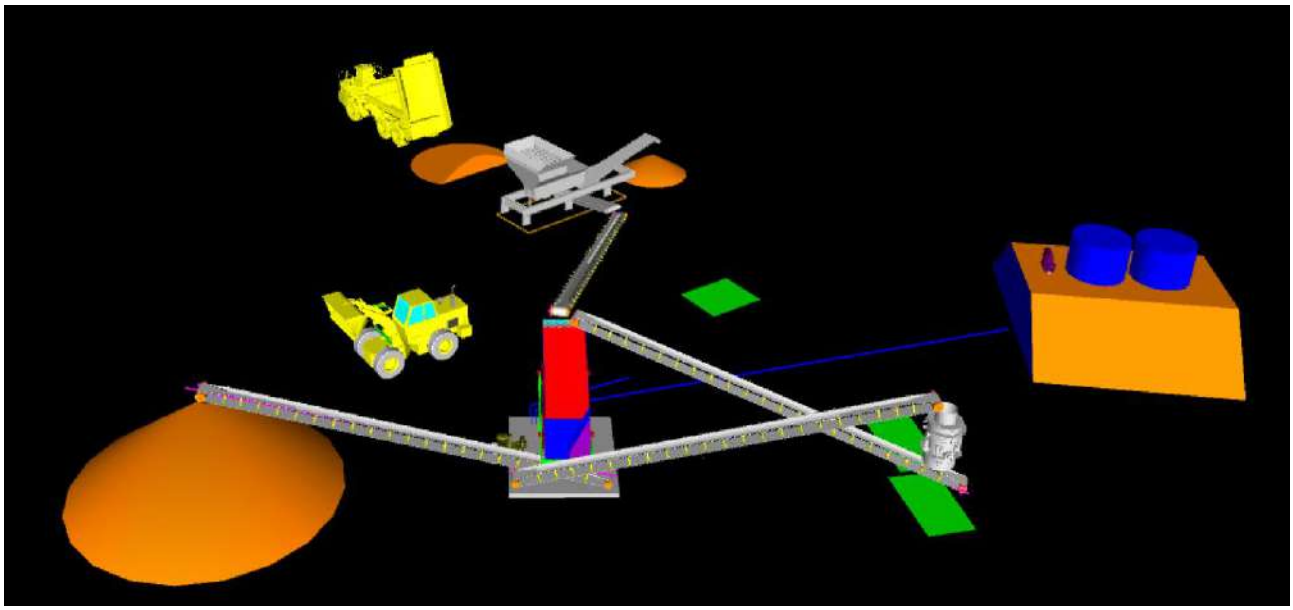


Figure 27: Phase 1 Crushing and Screening Circuit

Figure 28: Phase 1 Rehandling Circuit

5.2.2. Phase 2 Overview

The process design philosophy for Phase 2 for the crushing, screening and sorting plant was to achieve the following process outcomes:

- Construct a new crushing, screening and sorting plant adjacent to the existing plant
- Increase ROM throughput to a nominal 350tph to allow day shift only operations (ore sorter circuit and processing plant to operate 24/7) to reduce the overall operating costs of the operation
- Reduce material rehandling through combining the crushing and screening circuit with the ore sorting circuit
- Increase maximum feed size from 700mm to 1000mm through introduction of a jaw crusher

The Phase 2 crushing, screening and sorting circuits were designed in accordance with the design criteria in Table 13.

Table 13: Phase 2 Crushing, Screening and Sorting Design Criteria

Description	Criteria	Unit
General		
Ore Type	Dry and clean ore	
Ore Hardness	7	Mpa
Ore Abrasiveness	0.79	Ai
Maximum Lump Size	750	mm
Design Life	20	Years
Plant Size	1,000,000	tpa

The Phase 2 crushing, screening and sorting plant is shown in Figure 29.

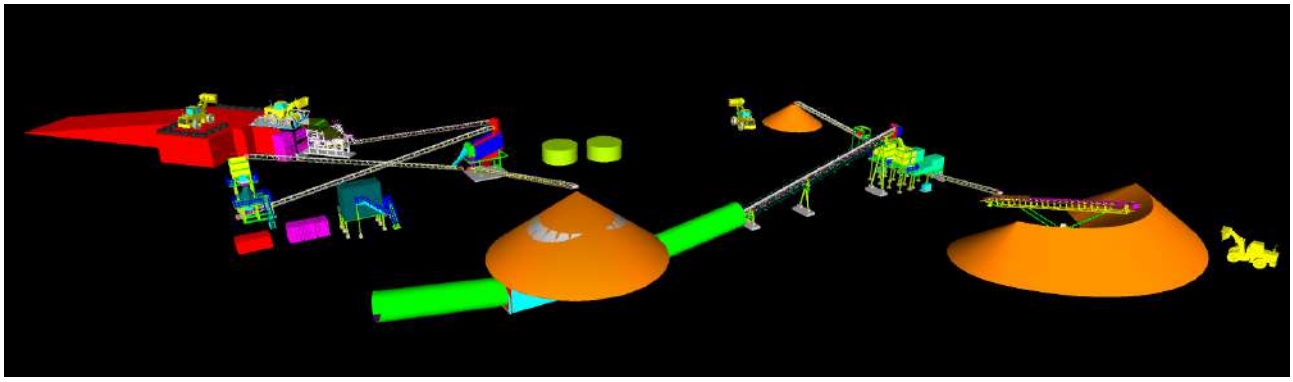


Figure 29: Phase 2 Crushing and Screening and Sorting Circuit

5.3. Processing Area

5.3.1. Phase 1

Overview

The existing processing plant at Mt Carbine is currently operating and successfully treating low grade stockpile and tailings material at a rate of approximately 60tph. EQR has an in-depth knowledge of the processing plant as an owner operator that has treated significant material volumes.

The processing plant is currently achieving the desired plant performance requirements for the feasibility study. Since commencing operations and the treatment of the low-grade stockpiles, EQR has achieved significant plant performance improvements over time by modifying the plant and feed conditions to maximise performance and yield.

Ausenco was engaged as a process plant specialist to review and audit the existing processing plant and identify and prioritise a range of upgrade options to further improve the plant performance for Phase 1.

Planned Improvements

Minimal modifications were identified for the processing plant as it is currently operating at the required throughput and availability for the Phase 1 requirements, these included:

- Pump change outs required to improve the pump reliability and availability;
- Reintroduction of a secondary rolls crusher enabling a duty/standby arrangement; and
- Control room and SCADA replacement as existing components are aged and have been discontinued by the vendor.

The processing plant modifications for Phase 1 will support the increased operating hours as the plant operations will increase from week on- week off to full time.

The current operational processing plant performance, throughput and yield data has been used as the basis of the Phase 1 plant design and philosophy.

Layout drawings of the processing plant are shown below in Figure 30 and Figure 31.

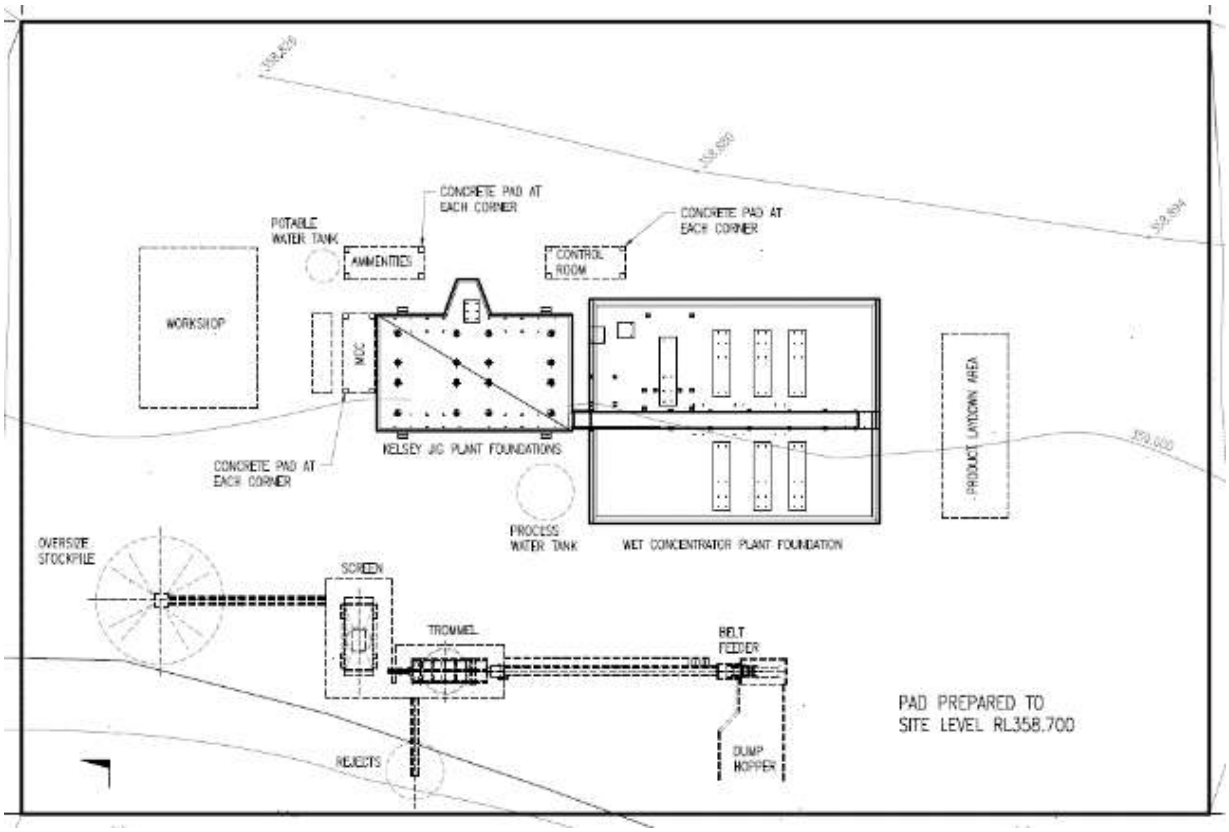


Figure 30: Processing Plant Site Layout

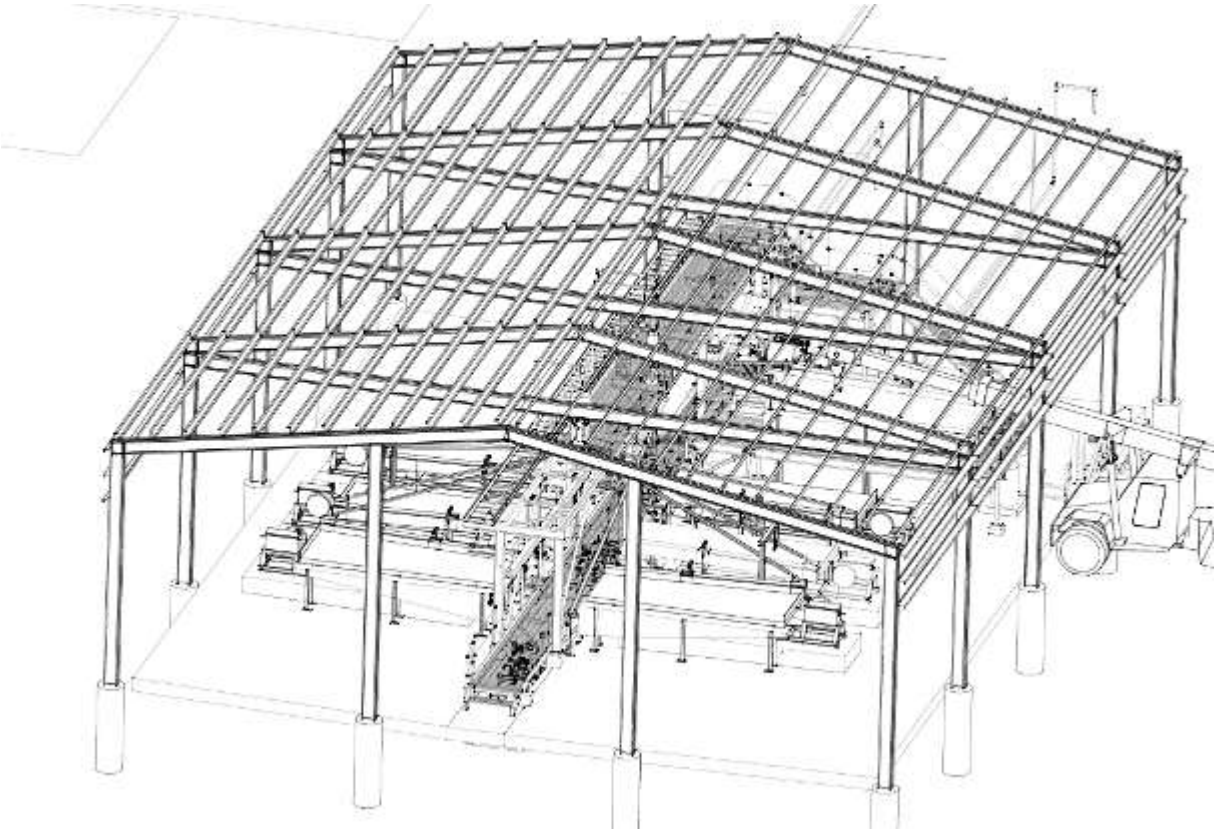


Figure 31: Wet Concentrator Plant

5.3.2. Phase 2

Overview

Based on the current recovery data, the existing processing plant is performing well and the approach to the plant upgrades was to maintain the plant circuitry and process as much as possible while improving the plant recovery performance to support the higher grade feed through the introduction of a scavenging circuit and additional tables capacity.

Operational Review

Ausenco attended the Mt Carbine site on two occasions. The first visit was in May 2021, where preliminary review of operating data and circuit configuration was conducted. Following the site visit several recommendations were made to improve the reliability and recovery of the operation and to collect data to confirm the tungsten losses and flowrates through the circuit.

A second site visit was performed at the beginning of September to further review the operation and to perform a plant sample campaign to confirm the operating parameters and performance for the plant. Two plant surveys were performed by Ausenco personnel during the visit to provide a snapshot of operational performance and to form the basis of engineering work.

Initial review of the site operating data showed that the Mt Carbine plant had an average tungsten shift recovery of approximately 47% between January and May 2021 producing a concentrate grade of 49% WO_3 during the same period.

Analysis of the operating and shift samples showed that the key issue in the plant recovery was in the jigging circuit, associated with high losses from lower grade material. This data is shown in Figure 32.

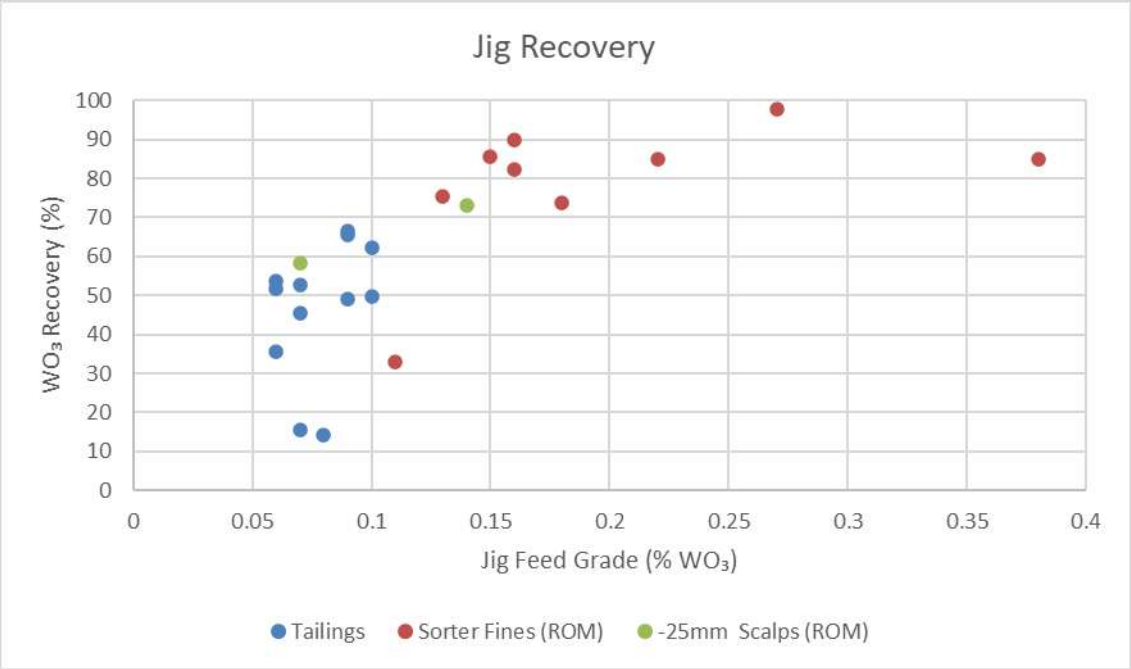


Figure 32: Jig Recovery vs Feed Grade by Feed Type

A subsequent review of overall plant recovery by ore feed showed two distinct periods of performance. Since the decision not to retreat tailings was made, plant recovery has increased and the range of performance outcomes has also decreased.

Based on the data below recoveries on 'fresh' ore are ~25% higher than those with tailings mixed, averaging 85% WO_3 recovery vs 60%. The goal of the upgrades is to consistently produce above 80% recovery from the plant through scavenging the jig tailings and increasing the capacity of the table recovery circuit. This is clearly shown in Figure 33.

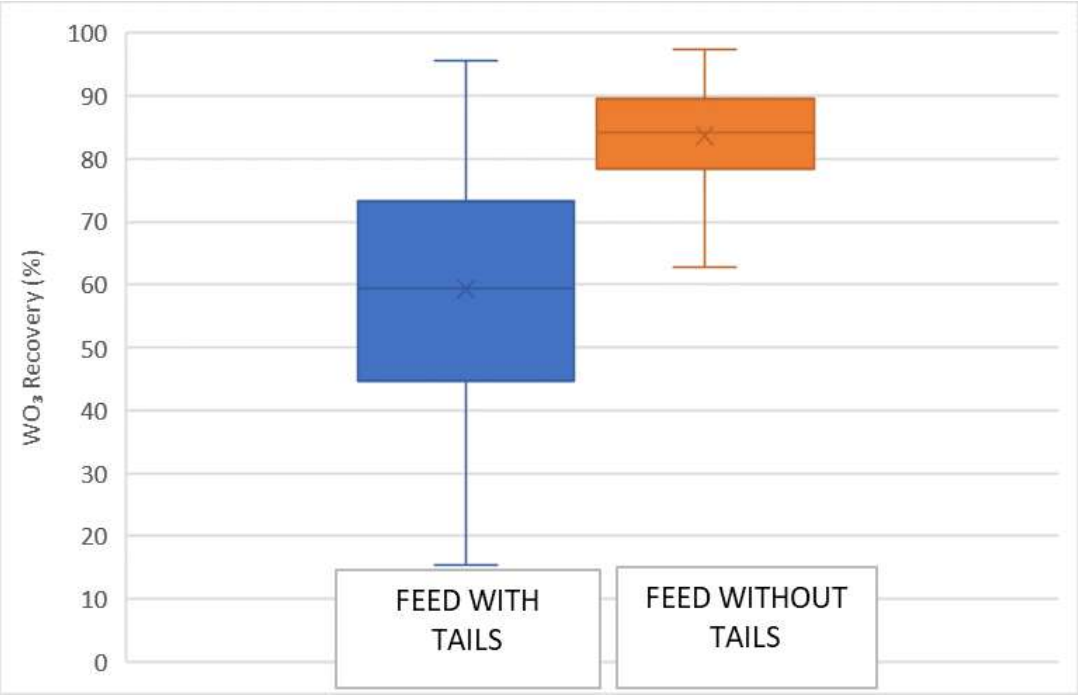


Figure 33: Plant Recovery Comparison with Tails and without Tails

Planned Improvements

The Phase 2 scope has been designed to ensure that the plant recovery does not reduce through the introduction of high grade ore from the open pit.

To support the higher head grade, a scavenging circuit will be introduced to minimise potential losses from the jig circuit. Additional tables will be included to account for the increased WO_3 grade in the feed.

Upgrades to the circuit have been developed based on an incremental and modular approach to design, with the additional facilities targeting the areas of major losses from the existing circuit. Where possible, changes to existing equipment have been minimised to reduce interruption to the existing operation, however due to capacity constraints upgrades to some equipment and pumps are required.

The basis for design (Table 14) for the process plant is summarised below:

- Plant nominal capacity of 60 t/h treating ore with a feed size of P95 -6mm
- Capacity to treat ore with feed grades into the front end of the circuit (jigs) of up to 0.5% WO_3
- Capacity to treat 16 t/h of ore sorter product at 0.85% WO_3 into the table circuit, with the balance of feed from the jigging circuit.
- Operate at average tungsten recovery of 77% from ROM feed to the Jig,
- Design flexibility to process 16 t/h of ore sorter product direct to the table circuit. Under this case, the circuit has been designed for 92% overall recovery which represents the maximum for design case.

Table 14: Design Basis

Criteria	Units	Design
Plant Throughput	t/h	60
Feed Size (P95)	mm	6
Design Feed Grade	% WO_3	0.5

Criteria	Units	Design
Overall Recovery (nominal)	%	79.5
Overall Recovery (max for design for table circuit)	%	92%

The main strategy to improve recovery through the circuit is based in increasing current jig capacity to reduce increase jig residence time. Review of the operating parameters and flow through the jigs highlighted that losses in the coarse fraction are most likely due to the low residence time in the jig and also due to the interstitial void of the ragging used.

As an additional means of recovery improvement, the two jigs will treat different size fractions (coarse and fine) which allows individual operating parameters and ragging to be optimised for each size fraction, being:

- Jig Duplication
- Jig Scavenging

In addition to recovery improvements, equipment was checked for capacity constraints. At higher head grades, the table circuit will become overloaded and require additional tables to remain within design loading rates.

Finally flowsheet modifications were driven by the future ore from the pit having elevated arsenic which necessitates removal for sale. As part of the arsenic removal circuit there is the opportunity to produce a separate wolframite product for production of ferrotungsten, being:

- Arsenic removal via the addition of a float cell; and
- Drying and product separation.

6. Infrastructure

6.1. On Site Infrastructure

6.1.1. Overview

Mt Carbine is currently operating and is well serviced with existing on-site infrastructure to support its operations.

The site infrastructure strategy for the project is to utilise as much as possible the existing site infrastructure and only construct new infrastructure if required to support new or upgraded facilities.

As the overall changes to the footprint and capacity of the mining and associated crushing, screening, XRT sorting and processing infrastructure is minimal, there are only minor site infrastructure modifications required to support the upgraded facility.

6.1.2. Existing Site Infrastructure

The site is already supported by well-established infrastructure supporting the current mine and quarry operations. The facilities include:

- Site access roads;
- Office buildings;
- Car park;
- Laboratory;
- Ablutions facilities;
- Crib areas;
- Power;
- Workshops;
- Site dams & drainage;
- Water supply pipelines;
- Safety and first aid equipment and
- Phone and internet connectivity.

6.1.3. Site Infrastructure Scope (Phase 1)

The scope for the on-site infrastructure work for Phase 1 of the project include:

- High voltage power supply and reticulation upgrades (sufficient for Phase 1 and 2);
- Fuel storage tank capacity increase (additional 12,000L) for mining operations; and
- Workshop and warehouse upgrades to store equipment spares and tools etc (containers);

6.1.4. Site Infrastructure Scope (Phase 2)

The scope for the on-site infrastructure work for Phase 2 of the project include:

- Water production bore prior to pit depletion to supply the sites raw water requirements;
- Waste management facilities at the wet processing plant;

- Containerised igloo workshops will be constructed for use at the crushing and screening plant and for the mining contractor; and
- Existing site offices will be refurbished to improve general amenities

6.2. Off Site Infrastructure

6.2.1. Overview

The Project's offsite infrastructure strategy follows the on site strategy, which is to maximise the use of existing infrastructure and only invest capital where required or where value has been identified.

6.2.2. Off Site Infrastructure Scope (Phase 1)

The scope for the off-site infrastructure work for Phase 1 of the project include:

- Utilisation of all/part additional mains electrical supply applied for and approved by Ergon Energy;
- Construction workforce accommodation (contractors and owners team personnel), prioritising the utilisation of several accommodation options in close proximity to the site including:
    - Contractor camp operated by the Mt Carbine Roadhouse;
    - Caravan Park; and
    - Mt Carbine Hotel.

Additionally further accommodation is able to be sourced under an hour from the site in local towns including Mt Molloy, Mareeba, Mossman and Port Douglas.

7. Project Execution

7.1. Staged Delivery Strategy

The Mt Carbine Expansion Project will be delivered using a staged approach with the scope split into three phases as summarised below:

Phase 1 shall focus on minimal capex, incremental improvements to increase the mine's productivity and profitability focusing solely on the mining and processing of the LGS.

Phase 2 will focus on the activities and works required to dewater and commence mining of the open pit. The crushing and screening plant and gravity processing plant will be upgraded to further reduce operating costs and increase tungsten recovery.

Phase 3 (focus of future study) shall investigate the commencement of underground mining activities at Mt Carbine to allow the continuation of mining once the open pit resource is exhausted.

7.2. Schedule and Milestones

The key Project execution milestones forecast dates are summarised in Table 15.

Table 15: Key Milestones

Milestone	Forecast Date
Phase 1	
Commence Engineering and Procurement	November 2021
Commence Approvals Process	November 2021
Commence Construction	December 2021
Construction Complete	February 2022
Commissioning Complete	February 2022
Phase 1 Approvals Received	April 2022
Phase 1 Complete	April 2022
Phase 2	
Commence Approvals Process	November 2021
Commence Engineering and Procurement	February 2022
Commence Construction	July 2022
Commence Mining Contractor Mobilisation	September 2022
Construction Complete	November 2022
Approvals Received	October 2022
Commissioning Complete	November 2022
Phase 2 Complete	November 2022

7.3. Project Management

The Project and construction management approach has been determined by the Project's procurement and contracting strategy summarised in Sections 7.7 and 7.8.

EQR will engage a project management firm to lead the project management of the Project and operate on its behalf in the management of the services, while incorporating relevant existing site personnel where necessary to provide input and management support.

The integrated management model is presented as a simplified chart below in Figure 34 where dotted line connectors reflect contract agreements while solid lines represent reporting and management responsibilities.

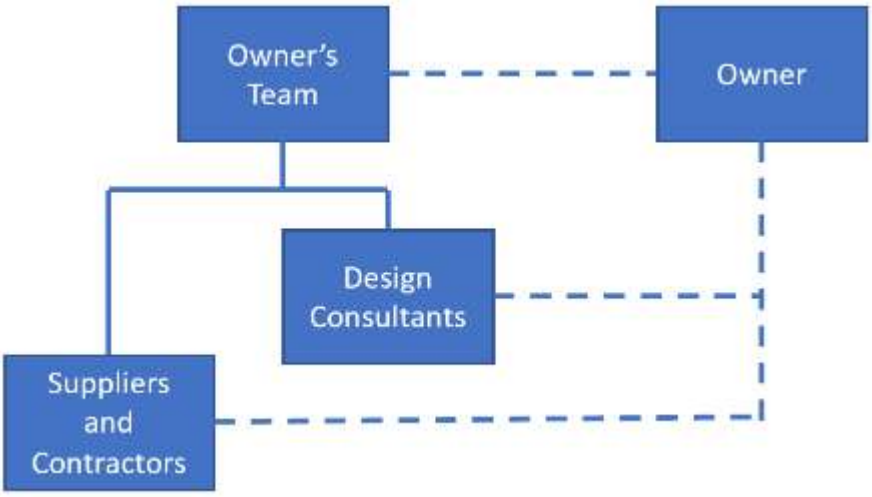


Figure 34: Owner's Team Contracting Structure

The benefits of executing the Project in an integrated owner's team capacity over a traditional engineer, procure, construct (EPC) approach include:

- Elimination of margin duplication (EPC contractor margin on subcontractor margin);
- Greater control of scope packaging and contractor selection;
- Enhanced ability to utilise local labour and contractors; and
- Greater ability to utilise and leverage operations personnel and experience in the management and delivery of the works.

The Owners' Team will coordinate and manage the execution of the delivery packages in accordance with the endorsed contracting strategy. Recognising the brownfield nature of the works and EQR's knowledge of the site, the project management partner will work closely with EQR and its preferred contractors, where appropriate, to maximise the existing knowledge and understanding of the site and existing infrastructure.

7.4. Construction Safety Approach

EQR's policies, procedures and legislative requirements establishes the minimum standards for safe work practices on the site. EQR's execution strategy will develop a culture where leadership is by example. EQR will demonstrate care and ensure an ongoing process of continuous improvement in this model. This will involve everyone, and the ultimate accountability will be by all.

The Project health and safety strategy will include:

- The safety and health management system (SHMS) will be fully integrated into the Project's delivery;
- Construction contractor's construction safety management plans will be assessed to ensure that at a minimum they meet the requirements of the site's SHMS prior to mobilisation. Where contractor

specific procedures and instructions are missing, these will be developed by the contractor, approved by the Owners' Team and incorporated into the sitewide SHMS;

- Statutory requirements as per the Mining and Quarrying Safety and Health Act 1999; and
- Aim to reduce employee risk by minimising high risk activities and reducing the labour requirements on site through the use of off site works, pre-assembly, modularisation and lower labour installation methodologies.

In accordance with the Mining and Quarrying Safety and Health Act 1999, the SSE will be the statutory safety authority over all activities on the mining leases. Once construction commences, the construction team will be required to liaise with the Site Senior Executive (SSE).

The SSE will appoint in writing suitable parties to fulfill electrical obligations for the execution and operations in accordance with the Mining and Quarrying Safety and Health Regulation 2017.

Leadership of safety will be at all levels and a key criteria of individuals' site performance and position descriptions.

7.5. Construction Risk

The Owners' Team will actively manage construction risks and work closely with all contractors involved with construction on a regular basis. The Owners' Team will routinely audit the safety performance and risk management activities of its contractors utilising the site's existing risk management platform.

The Project's approach to risk management is detailed in Chapter 14: Risk and Opportunity.

7.6. Construction Surface Water Management

There is no requirement to substantially alter the existing drainage infrastructure currently supporting the site and its operations. As far as construction activities are concerned, the only surface water management requirement is to ensure that all local runoff from the contractor's site is captured and directed into the site's existing drainage system.

Figure 35 below illustrates the site's drainage system.

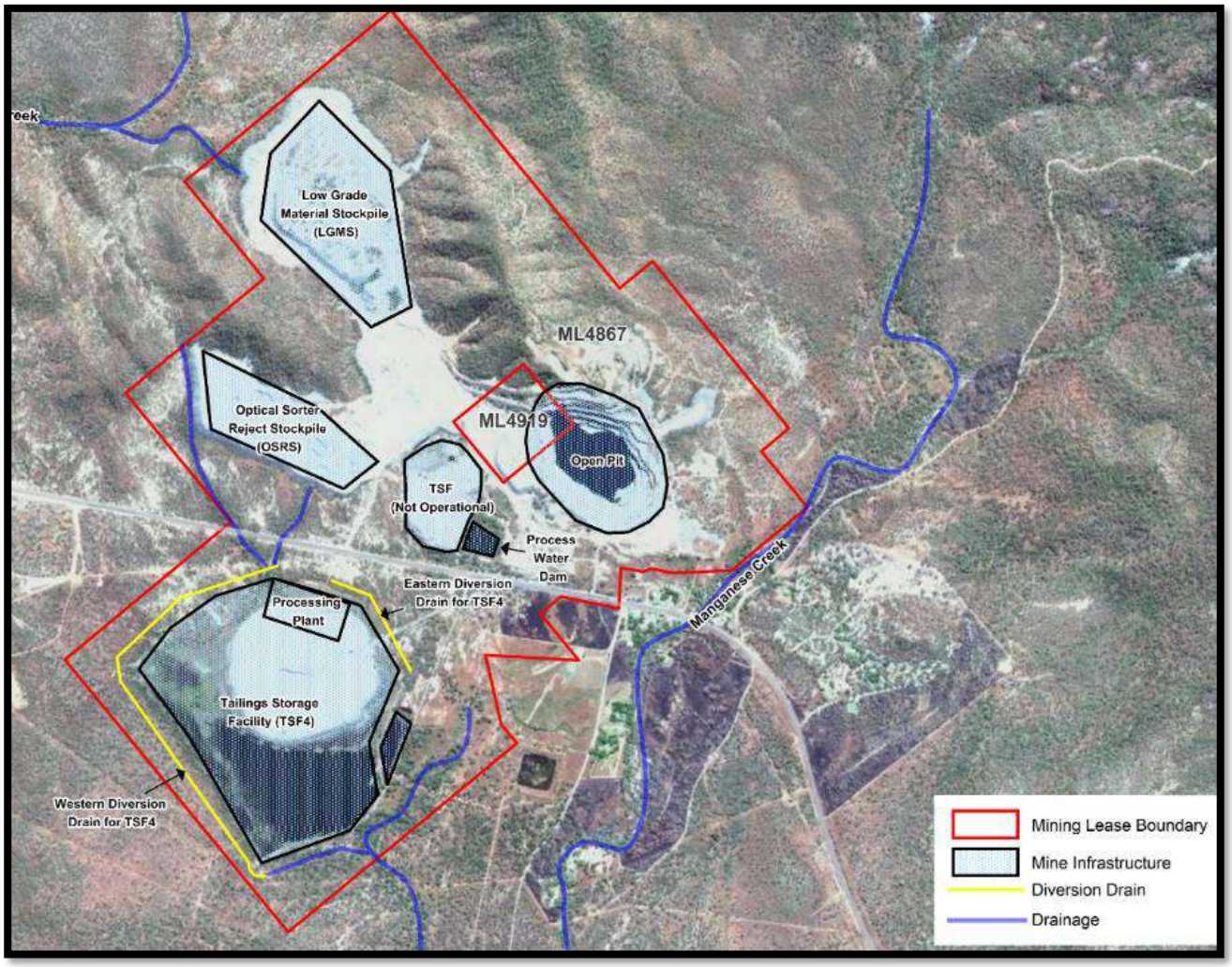


Figure 35: Sitewide Drainage

7.7. Contracting Strategy – Phase 1

The scope of Phase 1 has been assessed and split into contract packages for the procurement and implementation management by the Owner's Team. The major packages are summarised in Table 1616.

Table 16: Major Contract Packages

Package Type	Description
Design	Crushing and Sorting Plant Upgrade and Excess Product Dewatering
Design and Construct	Overhead Line and High Voltage Electrical Upgrade
	SCADA Upgrade
Supply	Structural Steel and Platework
	Pipework
	Conveyors
	Wet Screen
	Dewatering Screen

Package Type	Description
	Cyclones
	Pumps
	Water tanks
	Processing Plant Control Room
	Sorter Circuit Equipment - VSI and Wet Screen*
	Rolls Crusher*
	Containerised Storeroom and Workshops
Construct	Concrete
	Structural, Mechanical and Piping
	Low Voltage Electrical (including materials supply)
Mobile Equipment	Hyundai 980, CAT D6, 3 x Trucks*
	50t Excavator
	Bobcat

*Denotes packages managed by the EQR operations team

The identified long lead procurement packages that will require expedited design and procurement focus with a potential lead time of 16 weeks are:

- Conveyors;
- Wet Screen; and
- Dewatering Screen.

The Project duration will be minimised through the identification of existing second hand or off-the-shelf procurement items for the potential long lead items. Fabricators will be mobilised to the site for the conveyor steelwork fabrication and all conveyor items have been identified as in-stock from suppliers in Cairns. This will significantly reduce the lead times on all long lead items.

7.8. Contracting Strategy – Phase 2

The scope of Phase 2 has been assessed and split into contract packages for the procurement and implementation management by the Owner's Team. The major packages are summarised in Table 1616.

Table 17: Major Contract Packages

Package Type	Description
Design	Crushing, Screening and Sorting Plant
	Process Plant Upgrade
Supply	Structural Steel and Platework
	Pipework
	Valves
	Conveyors
	Crushing and Screening Equipment
	Process Equipment

Package Type	Description
	Electrical and Instrumentation
	Core Shed
	Water tanks
	Workshop
Construct	Concrete
	Structural, Mechanical and Piping
	Electrical
	Electrical and Instrumentation
	Workshop
	Core Shed

At the commencement of detailed design, long lead items will be identified and procured as a priority to ensure the schedule.

A decision will be made during the procurement phase as to whether any or all of the concrete, structural, mechanical, piping (SMP) and electrical and instrumentation (E&I) packages are split between the crushing screening and XRT sorting plant or combined into sitewide packages.

7.9. Shut Downs and Tie Ins

Whilst the Project is by nature a brownfield upgrade, a large proportion of the scope can be constructed effectively with minimal interface with the ongoing operations.

7.9.1. Phase 1

Phase 1 is largely comprised of brownfield tie ins to the existing crushing plant. Timing for the construction activities will be structured that they occur during planned shut downs or maintenance periods.

The timing of each activity will be structured to minimise plant down time. Key strategies include:

- Wet screen foundations will be constructed during a shut down and covered over until structure is ready for placement; and
- New mechanical equipment will have electrical tie in to new 500kVA substation minimising impacts on existing operations.

7.9.2. Phase 2

Crushing Screening and Sorting Plant

The new crushing, screening and XRT sorting plant is physically separated from the existing crushing plant, so its construction can occur with minimal interference to existing operations.

The XRT ore sorters will be relocated at the latest possible time, after no load commissioning of the feed and discharge conveyors is completed to minimise the down time in XRT sorter operations.

The electrical tie in to the 500kVA substation will be completed during operational down time.

Gravity Processing Plant

The gravity processing plant requires a significant number of tie ins to allow for the installation of new additional process equipment.

The equipment will largely be installed in and around the existing plant equipment. The tie in strategy for the new equipment to minimise the impacts on the existing operations involves the installation of a new motor

control centre (MCC) for all new equipment. This allows for the electrical wiring of the equipment to be done to an MCC that is not live and mitigates the risk of incorrect electrical isolation when installing the equipment.

Where pipes and equipment tie into the existing gravity processing plant, as much will be installed as possible prior to a plant shut down to install the tie ins. These may be done on a circuit-by-circuit basis to minimise the length of each shut down. A detailed shut down and tie in philosophy and plan will be developed in the execution phase.

8. Operations Management

8.1. Operating Philosophy

The Mt Carbine site is a mature operating site that has been running since the gravity plant started hot commissioning in February 2020. The EQR CEO is involved through strategically guiding the operation and Company from an explorer to a fully-fledged operation. The EQR CEO has over 30 years' of experience in managing mining operations through North America, Europe, and Africa. This experience has aided the development of a cohesive hands-on management approach and operations team development and restricted the reporting chain to ensure employees are empowered in their roles for efficient decision making and optimal outcomes.

EQR is an equal opportunity employer with support for bullying and harassment in the workplace as it works to build a team of skilled individuals from surrounding communities. The operation has an extensive Health and Safety Management system that protects employee's physical safety.

The operations are guided by the Integrated Management System (IMS) which addresses the intended outcomes of ISO 9001:2015 Quality Management Systems, ISO 14001:2015 Environmental Management Systems and IOS 45001:2018 Occupational Health and Safety Management Systems. The application of the Integrated Management System Manual (IMSM) will:

- Demonstrate EQR's ability to consistently provide quality quarry products that meets customer requirements and tungsten concentrate to meet the requirements of CRONIMET Australia and its downstream customers;
- Enhance customer satisfaction;
- Enhance environmental performance;
- Continually improve occupational safety and health;
- Achieve legal and other requirements; and
- Deliver on quality, environment, safety, and health objectives.

8.1.1. Operations Roster

The Operations Roster states the shift and leave cycles and demonstrate the impact of the cycles on productivity, ability to attract the required workforce, lost time, and costs. The operating cycles should be benchmarked against current local practice and international best practice.

Detailed roster information can be located in Chapter 8 – Operations Management.

8.1.2. Operational Approach (Phase 1)

The expansion of operations under the ongoing early works program will see the site mainly owner operated to ensure optimal running efficiency of the equipment and to ensure a low-cost base for the operations due to the focus on the LGS mining and processing. Specialty jobs will be contracted so that EQR does not have to retain these skill sets on a full-time basis.

The Early Works Program will ensure that processing capacities reach the targeted production levels using a combination of historic equipment and selected new capital purchases.

All operators and operations supervisors and management are engaged directly by Mt Carbine Retreatment Management Pty Ltd. Prior to the open pit mining operations commencing while development is completed, operational focus will be on the LGS which is a simplified mining methodology whereby the mined LGS material is delivered to the dry processing plant (crushing and screening). The LGS mining will take place on a day shift only basis while the dry processing plant, XRT Sorting (Sorting) and gravity processing plant will operate on a 24/7 roster.

Operations team employment has been increasing in line with the required processing capacities and roster changes and will have sufficient skilled personnel available to operate the processing plants as required.

Strategic contractors are engaged for speciality jobs to occur at site or should specialty jobs need to occur at off-site locations. Due to the ongoing operations at site, relationships are in place with key contractors which complete regular work on site.

With the ongoing operations, there is continuous maintenance planning and ongoing jobs taking place. EQR has found it best to outsource capital project jobs or sustaining capital projects to relevant contractors and where required external project management. This allows maintenance teams, production, and management to focus on the operational requirements while sustaining capital projects are completed as needed by external contractors.

8.1.3. Operational Approach (Phase 2)

The operating philosophy for Mt Carbine at completion of the Project will split between owner-operated and contract operated.

The open pit mining inclusive of drill and blast will be contract mined. The reasoning for this is that the skill requirement for the mining is outside of EQR's core capability, and to retain a lean organisational chart, contract mining was deemed to be the most sensible approach for the operations.

Given the inherent interrelation between the open pit mining and the LGS mining (a constant feed to the crushing and screening plant is required, though the source between the LGS and the open pit will alternate to suit the mine plan), the mining of the low-grade stockpiles will also be included in the open pit contract miner's responsibilities.

The battery limit for the contract mining will be the discharge of the run of mine (ROM) material either in the crushing and screening plant feed bin or adjacent. The basis of the feasibility study has allowed for the crushing and screening plant to be owner operated. If commercial benefits are identified in shifting to a contracting crushing and screening operation this option may be pursued in the future.

The gravity processing plant circuitry and operating philosophy remains largely unchanged and the operating philosophy for this reason will also remain unchanged. The gravity processing plant operating time will increase from week on-week off to full time operations, so the manning will increase, but the operating philosophy and shift and management structure will remain the same.

EQR will retain responsibility for the overall safety of the site through the SSE and the IMS as a guiding document for the site. EQR will also be responsible for the development of the quarterly mine and production planning along with the ore quality management. All these costs have been accounted for in the EQR financial modelling. More detailed mine planning will be the responsibility of the contract miner appointed at the relevant time in the future. EQR has started engaging multiple contractors for the mining of the open pit based on the information provided by DAS Mining Solutions and their pit optimisation modelling completed with this study.

8.2. Maintenance

The full-time maintenance team will comprise of the following positions:

- 1 x Maintenance Superintendent;
- 1 x Maintenance Foreman;
- 2 x Fitter;
- 1 x Boiler Maker;
- 1 x Boiler Maker Apprentice; and
- 2 x Electricians.

8.2.1. Mining

All maintenance on the mining equipment shall be the responsibility of the mining contractor. Mining equipment owned by EQR shall be provided for use free of charge to the contractor. The contractor shall be responsible for the maintenance of the free issued equipment in accordance with an approved maintenance schedule.

Until the mining contractor takes on the maintenance of the heavy earth moving equipment, a maintenance contractor will continue to complete heavy vehicle maintenance at site, working 2-3 days at site each week while the LGS mining is ongoing. This arrangement has been proven to work as it is currently being used on site.

8.2.2. Crushing, Screening and Processing

The day-to-day maintenance of the crushing and screening plant and the gravity processing plant will largely be undertaken by the maintenance team that is on site on a full-time basis. The team is highly skilled in the repair and maintenance of the plant and equipment and are currently providing all standard maintenance for the crushing, screening, and gravity processing plant.

Preventative Maintenance will be completed on an ongoing basis with each section of the processing plants, crushing and screening, sorting and the gravity plant receiving a planned 12hr shut down weekly to undertake required maintenance tasks. Any specialty jobs will have the relevant contractor brought in to complete the work. Capital projects will be outsourced to contractors as and when required to ensure the maintenance team stay focused on the maintenance of the crushing and screening plant.

To manage the maintenance at the Mt Carbine operations, EQR has taken out a subscription on the FIIX Maintenance Management software, this provides for the detailed tracking of maintenance and inventory for the site along with cost allocations to the plant and equipment used by the mine and associated analysis and reporting.

8.2.3. Mobile Machinery

Mobile machinery will be serviced at regular hour service intervals of 250, 500, 1,000, 2,000, 3,000, 5,000 and 6,000. This will be completed by an external service provider such as Toddy's Machinery Maintenance that specialises in work of this nature. A service schedule will be put in place to ensure work is completed according to required scheduled service intervals to maximise life of machines and their continued operational capabilities.

8.3. Transport and Logistics

The mine is located at 6888 Mulligan Highway, Mt Carbine which is easily accessible from all main ports, rail heads and cities in Far North Queensland. The highway is completely sealed and in good condition. As the mine is currently operational, supply chains and strong relationships have been setup with all major suppliers for equipment on site and ongoing spares required.

Transport of oversize equipment to site is easily achievable as evidenced by the delivery of the earth moving fleet delivered by CRONIMET in September 2021.

The concentrate is then transported via truck, by others, to the Townsville Port for export. Other Ports available for use are the Port in Mackay and Brisbane. Therefore, there are several major ports available to use for any international shipments.

The Cairns airport is approximately a 2-hour drive from site and is easily accessible for either people or freight deliveries. Due to the site being in Far North Queensland, spares are often flown into Cairns or Townsville and trucked to Mareeba as a central distribution point.

8.4. Procurement and Supply

Accounts have been setup with all major suppliers as the operation has been running for nearly two years through its pilot phase operations. Relationships and supply chains required for the operation have been established with a secure supply of parts and consumables required for ongoing operations.

The operation is relatively simplistic in nature and therefore no complicated sourcing of materials is foreseen by the operations team. The site is seen as semi-remote as it is approximately a 1-hour drive from a major township, therefore, planning is required for some of the more mine specific items as major transporters only deliver 3-days per week or for the items that are not be held in stock in Mareeba or Cairns.

With the industrial support base of Far North Queensland industry, it has been found that operationally, most spare parts can be delivered within a 24-hour period should a rush order be required. All deliveries are made via sealed highway, with no access issues to the site for oversized deliveries.

8.5. Administration

The administration for the project will continue to operate under the Corporate Services team led by the Administration Manager in a holistically similar manner regarding the current systems and protocols in place for ongoing operations. Going forward, EQR will employ an additional accountant to support the current staff contingent with the Corporate Services team operating on an 8hr per day, 5-days per week basis. EQR has established accounting and procurement systems and service providers to satisfy all requirements.

8.6. Health and Safety

8.6.1. Eliminating Hazards & Reducing Risks

Risk planning and management is central to the Company's activities, EQR's operations are only conducted when the risk is within acceptable limits and as low as reasonably practicable (ALARP).

The risk planning and management processes developed and implemented at the Mt Carbine site aim to provide a logical and systematic method of identifying, analysing, evaluating, treating, monitoring, and communicating risks.

The following hierarchy of controls is applied to mitigate risk to a level which is ALARP:

- Elimination/Removal;
- Substitution;
- Engineering/Isolation Control;
- Administration;
- Personal Protective Equipment; and
- Human Behaviour.

The hierarchy of control is to be used to control hazards identified for all risk management processes. Less reliable control measure (e.g., administrative, PPE or safe behaviour controls) should only be implemented as part of a holistic control strategy in addition to controls from the other, more effective categories, or on their own where the level of current risk is ALARP.

8.6.2. Risk Management – Principles and Guidelines

EQR's risk management is developed to comply with the requirements of *AS/NZ ISO 31000:2009 Risk Management – Principles and Guidelines*.

8.6.3. Management of Change

EQR Change Management (EQ RESOURCES-SAF-PRO-0034) procedure outlines processes for the prevention of non-compliances resulting from changes in the workplace at the Mt Carbine operations.

8.6.4. Procurement

All purchasing of materials, equipment and services are undertaken to ensure that any safety and health considerations are considered. Hazards are to be identified and assessed prior to the hire or lease of equipment or the supply of services or goods. Verification must be supplied that the delivery of equipment or supply of services complies with appropriate safety and health specifications, the Procurement Officer on site is responsible for this task.

8.6.5. Contractor Management

Contractors are pre-approved according to Contractor Management Procedure (EQ RESOURCES-SAF-PRO-0017) prior to attending site. Contractors approved by the SSE receive an induction before working on site. The induction covers site procedures necessary for that contractor's role.

If a contractor is required for a short-term emergency task on the mine site (such as repairs to phone lines) then that contractor will receive the visitor's induction and remain under the supervision of a fully inducted person during their time on site.

All contractors are required to provide and maintain a safe and healthy work environment and are responsible, as a minimum, for performing work to EQR safety and health standards.

8.6.6. Safety and Health Monitoring

It is essential to assess performance to evaluate progress against the requirements, targets, objectives, and to establish plans for continuous improvement.

To properly assess needs EQR:

- Conducts a systematic review of the corporate guidelines, standards, systems, and processes to verify the current standards and controls in place;
- Conducts audits and assessments at determined frequencies to measure the level of compliance and progress to the standards, and assist in the correction and prevention of any systemic issues;
- Reviews performance and accountability processes to indicate progress or deviations for early corrections; and
- Ensure procedures for Management Review and Health and Safety Objectives detail the processes to be applied.

8.6.7. Safety and Health Compliance

Periodic, at least annual, evaluation of compliance with applicable legal and other requirements will be planned to use the EQR internal and external audit schedule, in addition, legal compliance system Safety Law provides regular updates (at least monthly) to legal and other requirements.

8.6.8. Environment

The Environmental Programs (EPs) (maintained by EQR) are used to establish, implement, control, and maintain processes to meet the requirements of the IMS and implement the environmental objectives identified by the Company. The Environmental Monitoring and Reporting System (EMRS) records information pertinent to the implementation of the IMS governing the operations. The data is used to identify potential environmental risks that require management to assess achievement of the environmental objectives.

8.6.9. Roles, Responsibilities and Authorities

EQR's SSE has responsibility to ensure that the IMS is implemented. Tasks have been assigned by the SSE to Department Managers. The Department Managers may delegate the task to other personnel; however, the responsibility remains with the Department Manager. Safety, Health, Environmental & Training Manager supports the SSE and other managers in meeting the quality, environment, safety, and health objectives, and have responsibility for monitoring the implementation of the quality, environment, safety and health procedures.

Table 18: Roles and Responsibilities

Roles	IMS Responsibilities
Site Senior Executive	• Establish and communicate overall direction. • Develop quality, environment, safety and health policies. • Consider quality, environment, safety, and health requirements. • Develop quality, environment, safety, and health objectives. • Appropriately resource quality, environment, safety, and health management. • Ensure quality, environment, safety, and health compliance. • Promote continual improvement. • Identify interested party needs and expectations. • Review the operation of the IMS. • Conform to IMS requirements. • Promote customer focus throughout the Company.
Operations Manager	• Consider quality, environment, safety, and health requirements. • Develop quality, environment, safety, and health objectives. • Appropriately resource quality, environment, safety, and health management. • Ensure quality, environment, safety, and health compliance. • Promote continual improvement. • Identify interested party needs and expectations. • Review the operation of the IMS. • Conform to IMS requirements. • Promote customer focus throughout the Company.
Department Foreman	• Implement quality, environment, safety, and health procedures. • Review the operation of the IMS. • Conform to IMS requirements. • Participate in Management reviews. • Ensure loaded product meets physical and chemical specifications.

Roles	IMS Responsibilities
Safety, Health, Environment & Training Manager	• Monitor and report on overall IMS performance . • Review the operation of the IMS. • Identify and deliver training requirements. • Communicate and correspond with relevant regulators/local government regarding quality and environmental management. • Conform to IMS requirements. • Develop quality and environmental policy. • Ensure the IMS conforms to the relevant ISO Standards. • Maintain quality and environmental management system changes. • Ensure loaded product meets physical and chemical specification. • Develop safety and health policy. • Maintain safety and health management system changes. • Report on the performance of the safety and health management system to management.
All Personnel	• Conform to IMS requirements. • Discuss quality, environment, safety, and health improvement ideas with management. • Stop the process when the quality of the product is compromised, the environment has or can be affected, or the safety and health of workers is at risk. • Participate in quality, environment, safety, and health improvement programs.

8.7. Control of Records

Records shall be kept of all tasks and activities which relate to the IMS and to operational aspects which have the potential to affect the quality of the product, safety and health of people or the environment.

The records to be kept, shall include records required by acts, regulations, statutory codes of practice, and required by Australian Standards referenced in acts, regulations, and statutory codes of practice.

8.8. Accommodation

Employment will continue from the local region, so that the employees can work on a drive in, drive out (DIDO) basis. Employees are currently doing this, and it has worked fine for all parties involved. Certain personnel that live in more distant locations, for example Cairns, rent a space at the Mt Carbine Caravan Park, next to the mine site, for the duration of their shift and commute to their place of residence at the conclusion of their swing. The Mt Carbine Motel also offers operators and contractors nightly rates with meals included for those working on shift or performing contracts in the area.

8.9. Emergency Response Plans

EQR's Emergency Response Management Plan (EQ RESOURCES-SAF-PLN-0003) minimises the level of risk to life, property, and the environment due to an emergency situation.

The EQR Emergency Response Management Plan describes the immediate actions required by designated site personnel.

All personnel are required to undergo site and specific area inductions to familiarise themselves with locations of emergency equipment and evacuation points. Emergency contact details and procedures are provided during their induction.

9. Closure and Rehabilitation

9.1. Approach

The closure strategy encompasses a staged approach to rationalising land and water management, environmental monitoring and compliance.

- Stage 1 includes a review of existing site conditions and the Environmental Authorities (EAs); identifying necessary modifications as relevant and developing a plan to affect change.
- Stage 2 is the development of an optimisation plan for the land and water management and monitoring across the Project site.
- Stage 3 involves updating supporting regulatory and management documentation and implementation.

Although a source of licensing complexity, the co-existence of the quarry and mining activities results in the beneficial re-use of tailings and low-grade ore stockpiles located on the site that are remnant from previous operations on the site; as well as the use of non-mineralised material and reuse of process residues associated with the renewed open pit mining. This is a significant outcome for rehabilitation and closure considerations *ie* the solid wastes (process residue and waste rock materials) associated with mining are inventory for the quarry.

9.2. Risk

The Risk Assessment for the Project is presented in Chapter 14: Risk and Opportunity. From a closure perspective, failure to achieve the intended outcome, expressed as being the successful surrender of the EAs that apply to the land on which quarry and mining activities occur, is the risk. The reason for failure may be technical or regulatory and are not necessarily independent. Technical reasons for failure broadly concern environmental values such as land and water; whereas the regulatory reasons pertain to, for example, license conditions and overarching legislation.

10. Environment and Approvals

10.1. Current Status

The land relevant to the Project site is used for quarry and mining activities as per the respective licenses (EA EPPR00438313, dated 16 March 2021 for the quarry and EA EPML00956913, dated 1 December 2020 for the mine). Notifiable activities are defined in Schedule 3 of the Environmental Protection Act 1994 (EP Act). No notifiable activities are planned to occur as part of the quarry activities under EA EPPR00438313. Lot 13 on Plan SP254833 is included on the Environmental Management Register (EMR) as the site has been subject to the following notifications associated with the mining activity undertaken pursuant to EA EPML00956913: Mine Waste, Mineral Processing, Petroleum Product or Oil Storage. Environmentally relevant activities (ERAs) are defined in the Environmental Protection Regulation 2019 (EP Reg). The ERAs listed in Table 19 are licenced under EA EPPR00438313 for the quarry and under EA EPML00956913 for the mine.

Table 19: Existing ERAs for the Project Site

ERA No.	Activity	Threshold
EA EPPR00438313 for the quarry activity		
16	Extractive and Screening	Extraction and Screening 3: Screening, in a year, the following quantity of material (b) more than 100,000t but not more than 1,000,000t
16	Extractive and Screening	Extraction and Screening 2: Extracting, other than by dredging, in a year, the following quantity of material (b) more than 100,000t but not more than 1,000,000t
EA EPML00956913 for the mine activity		
14	Electricity Generation	Ancillary 14 - Electricity Generation 2: Generating electricity by using a fuel, other than gas, at a rated capacity of (a) 10MW electrical to 150MW electrical
8	Chemical Storage	Ancillary 08 - Chemical Storage 4: storing 200t or more of chemicals that are solids or gases, other than chemicals mentioned in items 1 to 3, under subsection (1)(d)
15	Fuel Burning	Ancillary 15 - Fuel burning: Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour
31	Mineral Processing	Ancillary 31 - Mineral processing 2: Processing, in a year, the following quantities of mineral products, other than coke (a) 1000t to 100,000t
8	Chemical Storage	Ancillary 08 - Chemical Storage 3: Storing more than 500 cubic metres of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)
8	Chemical Storage	Ancillary 08 - Chemical Storage 5: storing 200 cubic metres or more of chemicals that are liquids, other than chemicals mentioned in items 1 to 3, under subsection (1)(d)
8	Chemical Storage	Ancillary 08 - Chemical Storage 1: Storing a total of 50t or more of chemicals of dangerous goods class 1 or class 2, division 2.3 under subsection (1)(a)
Schedule 3 19	Mining	Schedule 3 19: Mining metal ore, other than a metal ore mentioned in items 11, 12, 14, 15, 16,17 or 18

In regard to the requirement for an End Of Waste (EOW) code for the Mt Carbine Project, the Administering Authority has determined that an EOW approval or code is not required.

10.2. Relevant Environmental Legislation

There are Commonwealth, Queensland and local government legislation that are relevant to the broad topic of management of values, a list of legislation is provided below. The Project is an existing activity and is licensed to operate. For the proposed renewal of open pit mining an application to amend the existing EA will be necessary and is discussed in Chapter 10.

Commonwealth legislation:

- Environmental Protection and Biodiversity Conservation Act 1999
- Native Title Act 1993
- National Environmental Protection Council Act 1994
- National Greenhouse and Energy Reporting Act 2007
- Energy Efficiency Opportunities Act 2006
- Clean Energy Act 2011

Queensland legislation:

- Environmental Protection Act 1994
- Mineral and Energy Resources (Financial Provisioning) Act 2018
- Mineral Resources Act 1989
- Aboriginal Cultural Heritage Act 2003
- Queensland Heritage Act 1992
- Water Act 2000
- Planning Act 2016
- Transport Infrastructure Act 1994
- State Development and Public Works Organisation Act 1971
- Nature Conservation Act 1992
- Environmental Offsets Act 2014
- Vegetation Management Act 1999
- Biosecurity Act 2014
- Waste Reduction and Recycling Act 2011
- Local Government Act 2009

Local Government – Mareeba Shire Council

- Local Government is not recognised in the nation's constitution and owes its existence to State Government legislation (Local Government Act 2009). The role, functions and boundaries of Local Governments are subject to the discretion of the State Government.
- Mareeba Shire Council Planning Scheme 2016.

10.3. Required Approvals

The EA for the mining activity i.e. EA EPML00956913, dated 1 December 2020, permits mineral processing at an annual rate of 1,000t to 100,000t. An application for an increased rate of mineral processing to an annual rate of 500,000t was submitted on 1 December 2021.

Notwithstanding that the renewed activities:

- will be limited to the existing bounds of the MLs;
- occur on land areas that have been disturbed by previous mining activities; and
- the existing EA EPML00956913 includes conditions relevant to these impacts;

it will be necessary to apply for an EA amendment for the mining activity *ie* EA EPML00956913.

A register of the required approvals in included in Table 20.

Table 20: Approvals Register

Application Path	Permit	Legislation	Agency/ Assessment Manager	Project Aspect	Required to commence construction or to commence operation	Comments
EA amendment application	EA EPML00956913	EP Act	Department of Environment and Science	Mine	Necessary for increased rate of production through the process plant.	Required for Phase 1 processing plant throughput.
EA amendment application	EA EPML00956913	EP Act	Department of Environment and Science	Mine	Necessary for renewal of open pit mining.	Required for Phase 2.
EA amendment application	EA EPPR00438313	EP Act	Department of Environment and Science	Quarry	May be required to align EA EPML00956913 and EA EPPR00438313.	May be required for Phase 2.
Application	Water Licence	Water Act 2000	Department of Regional Development, Manufacturing and Water	Mine	Not expected to be required.	There is no moratorium over the area, or a groundwater management plan, and no requirement for development approval for drilling. It is not expected that a licence will be required.

Application Path	Permit	Legislation	Agency/ Assessment Manager	Project Aspect	Required to commence construction or to commence operation	Comments
Application	Road Corridor Permit	Transport Infrastructure Act 1994	Department of Transport and Main Roads (TMR)	Mine	Not expected to be required.	The Project area has been dissected by the State Road since grant of title. It is expected that the Blast Management Plan, developed with stakeholder engagement, will address TMR's requirements. It is expected that use of the culvert for conveyance of pipes will prevail without the need for additional permitting.

10.4. Environmental Management and Monitoring

As detailed in Chapter 9: Closure and Rehabilitation, a strategic approach has been adopted to monitoring and reporting. The overarching intent is for all environmental monitoring and compliance programs, together with all associated reporting prepared under the auspices of the EAs, Progressive Rehabilitation & Closure Plan (PRCP) and PRCP schedule and similarly for future regulatory tools, to serve not only the purpose of compliance but to ultimately provide evidence for successful closure and final relinquishment.

11. Community and Stakeholders

11.1. Guiding Principles to Community and Stakeholders

EQR is a value-oriented resource company, sustainably producing and managing new economy minerals and metals. Embedded in our philosophy is minimising our footprint where possible. The guiding principles for community and stakeholder engagement are summarised in Table 21.

Table 21: Guiding Principles

Guiding principles					
We will be	**Proactive**	**Flexible and inclusive**	**Genuine**	**Respectful**	**Responsive**
This means	We will engage with communities early and often, so that we understand and respond to their interests and concerns.	We will offer a range of engagement opportunities that are tailored to the variety of needs and preferences of the community.	We will have authentic conversations with the community, clearly explaining what can and can't be influenced.	We understand that not everyone will support our projects. We will create an environment to have professional conversations.	We will close the loop, providing feedback to the community on how input has been taken into consideration.

11.2. Engagement Approach

The focus for EQR is delivering value for investors and sustainably producing new economy minerals and metals, while minimising its footprint where possible. This including in the communities in which it operates. The Community and Stakeholder Engagement Plan (CSEP) sets out the framework for effective consultation and engagement. While the implementation plan uses a broad range of tools and techniques to ensure we are meeting the needs of stakeholders and delivering consistent messages in a timely manner.

Gathering different views contributes to a richer understanding of how to effectively meet the organisation's goals and inform the engagement or communication that needs to take place. It is important for EQR because:

- **Support** - It will support its operations and help new growth projects in the region.
- **Social licence** - Maintain and improve its social licence, supporting current and future opportunities in the region.
- **Trust -** Lead the conversation about change, creating trust, and open communication with the community and all stakeholders.

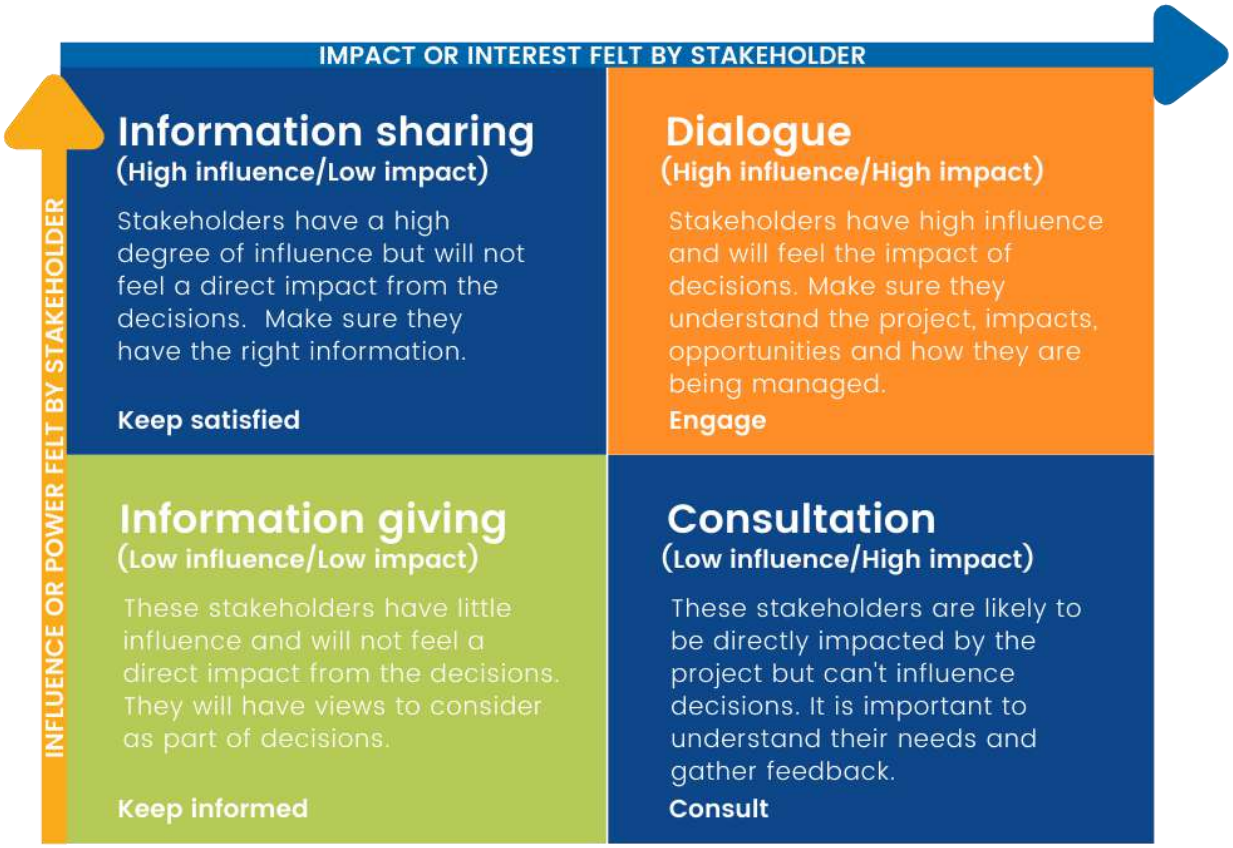
The focus of engagement activities is to work with those most impacted by the Project's operations or who have a high level of influence on the Project at each phase.

11.3. Stakeholders

A stakeholder risk assessment was carried out to map relevant stakeholders in terms of their interest in potential sites for different option types and their potential to influence Project outcomes. The analysis identified four overarching stakeholder categories, defined in the Stakeholder Mapping and Consultation Register (the

Register). The Register is a living document and to be updated as interactions with stakeholder occur. The Register will help identify trends, monitor activities for which reporting metrics can be extracted.

Figure 36: Stakeholder Matrix (Source: Mara Consulting)



11.4. Potential Issues and Mitigations

During the planning and research of developing the plan, a SWOT analysis was completed. This assisted in the evaluation of the Project, including identifying internal and external factors, that may impact the Project in both positive and negative ways. Each statement was examined with appropriate actions identified to capitalise on strengths and opportunities and mitigate weaknesses and threats. An analysis of the items raised helped to set clear priorities for the engagement.

Pre-empting and proactively managing stakeholder issues is crucial to the overall success of the Project. Given the nature and profile of the Project, stakeholder expectations require careful management.

Table 22 identifies risk considerations related to the Project.

Table 22: Risk Considerations

Risk Considerations*	Yes	No	Potentially
Is the Project politically sensitive (either local or state government level)?		✓	
Is the Project likely to cause disruption to essential community services?		✓	
Is the Project likely to impact on environmentally sensitive areas?			✓

Risk Considerations*	Yes	No	Potentially
Is the Project likely to cause disruption to local residents or businesses?	✓		
Is the Project likely to be opposed by any groups or individuals within the community?			✓
Does the Project deal with issues or decisions that are likely to be controversial or divisive?			✓
Is the Project likely to attract a media attention (either positive or negative)?			✓

** Note – the risk considerations will be regularly updated as the Project progresses. This is an overview of potential risks.*

11.5. Communication and Engagement

Underpinning the Project team's commitment to effective engagement is mutual respect. The team is committed to:

- Honest and straightforward dealings with stakeholders;
- Providing accurate and timely information to stakeholders;
- Using plain language to describe Project activities;
- Actively listening and acknowledging other points of view; and
- Respecting individual and cultural differences always.

Engagement methods will vary depending on the purpose and expectations of the engagement. Selecting the right tool and taking time to plan the engagement process will help build trust and buy-in from stakeholders.

11.6. Complaints and Enquires Management

EQR (or designated contractor) will receive Project enquiries and complaints via a dedicated Project hotline and Project specific email. This contact information will be included on all communications materials related to the Project. The Consultation Register will be used for the duration of the Project. EQR (or designated contractor) will:

- Record details of every complaint or enquiry in the Consultation Register including date and time of complaint and how the complaint was received;
- Record full name, address and preferred method of contact for the complainant;
- Record how the complaint or enquiry was managed and closed out;
- Investigate and determine the source of the complaint;
- Record action taken, officers involved, details of resolution and response times;
- Refer misdirected complaints or enquiries to the appropriate authority; and
- Produce monthly reports to ensure complaints are managed effectively.

11.7. Timing

Engagement and communication are a cradle to grave approach, that is it is ongoing through the operations of the Mt Carbine facility. During operations, there will be a need to increase activities to support the Project's lifecycle phase. Specifically, between late 2021 and early 2023 two environmental approvals will be sought.

Phase 1 EA is seeking to increase processing of current stockpiles to 500,000 tpa. The focus is to incrementally improve the mine's productivity and profitability, focusing solely on the mining and processing of the LGS. This is likely to have minimal impacts.

Phase 2 EA is seeking to dewater and recommence mining tungsten in the existing pit area. The crushing and screening plant and processing plant will be upgraded to further reduce operating costs and increase the tungsten recovery. The Project timeline is summarised in Figure 37.

Figure 37: Project Timeline

Consultation will support the technical studies, with targeted engagement with affected stakeholders. An implementation plan will guide communication and engagement tided to the Project timeline. Initially, the focus will be to introduce the operation and amendments to stakeholders, followed by gathering feedback on the Phase 2 proposal, particularly with directly impacted stakeholders.

Communication and engagement are rarely static, and they are likely to change on a regular basis. Mt Carbine will change and have different stakeholder requirements at each stage of the Project. Each stage of the Project will be an opportunity to gather feedback and support the Project. At each point in preparing engagement activities, we follow four general phases: preparation, planning, delivery, and review.

12. Capital Cost Estimate

12.1. Accuracy of Estimate

The accuracy of the capital cost estimate is considered to be in accordance with Budget / Authorisation Estimate as defined by AACE 47R-11 Standard: Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Mining and Mineral Processing Industries.

12.2. Estimate Basis

12.2.1. Direct Costs

Consultants were engaged to provide engineering and estimating services for their relevant scopes in accordance with a AACE 47R-11 Class 3 estimate.

The consultants engaged to provide input into the estimate are listed in Table 23.

Table 23: Estimate Contributors

Estimate Scope	Consultant
Crushing and Screening Plant Sorting Plant Tailings Dewatering Plant	Mincore
Processing Plant	Ausenco
High Voltage Power Upgrade	Woodburn Electrical
Site Infrastructure Project Management	JukesTodd
Approvals and Rehabilitation	NRA Environmental Consultants

The basis of the estimating methodologies for the various scope components are summarised below in Table 24.

Table 24: Direct Cost Estimate Methodology

Description	Base Case
Earthworks	Consultant in-house database of costs for recently completed projects.
Buildings	Recent historic equivalent purchases by EQR.
Concrete Works	Priced from consultant in-house database and compared to previous Mt Carbine project actual costs.
Major Mechanical Equipment (packages over $10k)	Budget quotes from OEMs based on equipment datasheets.
Minor Mechanical Equipment (packages under $10k)	Consultant in-house database of costs for recently completed projects.
Structural Steel Supply	Consultant in-house database of costs for recently completed projects.
Platework	Consultant in-house database of costs for recently completed projects.

Description	Base Case
Structural, Mechanical and Plate Work Installation Costs	Unit man-hours per tonne of steel and equipment.
Piping	Consultant in-house database of costs for recently completed projects.
Electrical Control and Instrumentation supply	Factored from historic projects and checked using reference projects.
First Fills and Spares	Factored from historic projects and checked using reference projects.
HV Upgrade	Firm quote from local contractor familiar with the site and project.
SCADA Replacement	Firm quote from local contractor familiar with the site and project.
Container Workshops	Consultant in-house database of costs for recently completed projects.
Engineering	Budget estimates provided by engineering consultants delivering the relevant study scope.
Mobile Equipment	Firm pricing from OEM suppliers or advertised available second hand prices.

12.2.2. Indirect Costs

The basis of the estimating methodologies for the indirect cost components are summarised below in Table 25.

Table 25: Indirect Cost Estimate Methodology

Description	Base Case
Approvals	Known government fees and budget pricing for consultant activities.
Project Management	First principles manhour build-up against the execution schedule.
Contingency	Risk ranging was performed on the capex items and a Monte Carlo simulation was performed to develop a P90 contingency estimate.
Escalation	Given the short duration of the Project, escalation was not included in the capital estimate.

12.3. Estimate Summary

Estimate summaries at WBS level 1 are provided in Table 26.

Table 26: Estimate Summary

WBS Code	WBS Descriptions	Cost (AUD)
10000	Mining	2,431,000
20000	Processing	14,527,258
30000	On-site Infrastructure	1,235,188

WBS Code	WBS Descriptions	Cost (AUD)
70000	Project Indirects	1,443,460
80000	Owner's Costs	1,804,123
90000	Contingency	1,516,591
	Total	**22,957,620**

12.4. Contingency Analysis

12.4.1. Inputs

A risk based, probabilistic analysis of the capital costs was undertaken in order to develop the Project contingency.

12.4.2. Outputs

The variance analysis provided the outputs summarised below.

The Project has adopted the P_{90} case as the estimate position with a contingency value of AUD1,532,427.

Table 27: Probabilistic Project Costs

Probability	Project Cost (AUD)
10%	21,339,992
20%	21,555,765
30%	21,724,010
40%	21,874,697
50%	22,024,637
60%	22,175,941
70%	22,378,255
80%	22,572,588
90%	**22,957,620**
95%	23,061,873
99%	23,461,593

13. Operating Cost Estimate

13.1. Basis of Estimate

13.1.1. Accuracy of Estimate

All operating costs are presented in real terms as of 1 December 2021. All cost assumptions were derived from cost data from varying sources:

- Mining costs were developed using a combination of existing mining data combined with contractor pricing and consultant input (DAS Mining Solutions);
- Crushing screening and sorting pricing from existing data combined with consultant pricing (Mincore); and
- Processing plant pricing from existing data combined with consultant pricing (Ausenco).

Based on the alignment between contract data, and DAS Mining Solutions equipment data base, the order of accuracy for mining equipment has been determined to be between -10%/+15%. This order of accuracy also applies to the crushing, screening, sorting, and processing opex costs based on current expenditure at Mt Carbine.

13.1.2. Source Documentation

For the compilation of the operating cost estimate, all activities were identified relating to the extraction of ore from the open pit mine and LGS to loading of trucks at the mine gate. Cost estimates were then developed for each activity benchmarked against the following:

- First principles estimates;
- Consultants' data derived from similar external projects;
- Use of actual costs from the existing operation; and
- Contracts currently in place at Mt Carbine.

The activities were separated into:

- Mining activities to deliver ore to the ROM pad;
- Crushing, screening, and sorting;
- Processing; and
- Other site related costs.

13.2. Key Assumptions

The key assumptions utilised in the operating cost estimate are included in Table 28.

Table 28: Operating Cost Estimate Key Assumptions

Item	Assumption
Base Data	Products or services used in more than one function of the operation were identified and used as standard cost assumptions. These items include diesel fuel, explosives, and electricity.
Diesel Fuel Prices	The fuel price is based on the current average prices of existing operations at Mt Carbine. The wholesale cost of diesel fuel was estimated at AUD1.401. Upon application of the diesel rebate (after GST removal) of AUD0.401/L, the diesel price used for opex costs was AUD1.00.

Item	Assumption
Explosives Costs	Estimates were provided for drill and blast costs by consultants DAS Mining Solutions, with pricing estimates based on recent experience and unit drill and blast costs benchmarked against contractor pricing from Orana Drilling. Prices were all inclusive as a rock on ground (AUD2.83/BCM) service to include drilling, emulsion supply, loading, stemming, and shot firing.
Electricity	The electricity price is based on the forecast provided by the current mine supplier (Ergon). Forecasted data is based on recent historical usage and was considered the most accurate. The electricity price used for opex costs was AUD0.19 per kWh.
Exchange Rates	The base case AUD/USD foreign exchange forecasts assumed for the duration of the operations was 0.73.

13.3. Operating Cost Summary

All operating costs are presented in real terms as of December 2021 in Table 29. Further details pertaining to the development of the mining and processing scope and costs can be found in Chapter 4: Mining and Chapter 5: Processing.

Table 29: Summary of Operating Costs per Tonne

Operating Cost Item	Cost (USD)
Operating costs of FCA (real) steady state life of mine (C1 cash cost)	**113/mtu**
Operating Cost Components	**Cost (AUD)**
Mining Costs	
• Open cut mining costs of for mining of the open pit by a contractor	4.50/ ROM t
• LGS Mining for 24/hr operations (Phase 2)	2.47/t
• LGS Mining for 12/hr operations (Phase 1)	1.68/t
Mine Closure/Rehabilitation & Ancillary Equipment	0.26/t
Dry processing costs	2.00/t (feed)
Ore Sorting costs	1.49/t (feed)
Gravity processing plant costs incl. by-product management	12.45/t (feed)
Other costs based on internal estimates, lease vehicles, grade control, sampling, drilling and lab testing, contractor mobilisation to site, maintenance facility cost and contractor demobilisation.	1.98/t

14. Risk and Opportunity

14.1. Scope

The risk management activities which were conducted to support the development of the feasibility study and prepare for the execution phase of the project include:

- Completion of initial Project risk assessments and identification;
- Establishment of the Project Risk & Opportunity Register;
- Identification of Project related compliance obligations, including any risks of non-compliance; and
- Ongoing management of risks, compliance obligations and actions.

14.2. Risk Assessment Process

The risk assessment process has to date and will in future continue to involve desktop reviews, interviews with key EQR personnel and stakeholders, and subject specific workshops. The consolidated product of that assessment process is presented to the EQR management team to validate.

All risks are captured in the Project Risk & Opportunity Register.

Risk management involves identification, assessment and management of risks and opportunities with the ability to impact on:

- Health and Safety
- Security
- Natural environment
- Assets
- Project cost / schedule
- Schedule / production
- Project return
- Compliance / governance
- Community
- Reputation
- Shareholder value

14.3. Risks

The key risks identified during the feasibility study are summarised in Table 30.

Table 30: Key Risks

Risk ID	Risk	Cause	Impact	Current Controls	Current Rating
2	HV / LV interaction	Poor traffic management Fatigue	Injury, vehicle damage	Installation of berms on the haul road (divided road) LV to have separate roads Radio protocols Fatigue Management Plan	High

Risk ID	Risk	Cause	Impact	Current Controls	Current Rating
5	Noise and dust pollution	High silica content in dust Older equipment First crusher (rock) screen has no dust control	Health impact on site personnel Impact on neighbours (town)	Water trucks Water added to crusher PPE Wet screen being added to crusher Good stakeholder communications	High
7	Loss of production	Poor mining productivity Wet season impact	Failure to achieve financial targets	Mine planning Redundancy in mining equipment Addition of wet screening Increased equipment sizing	High
10	HV / LV accident on the Mulligan Highway crossing	No controls on the road HV operator not stopping before crossing highway	Fatality	Traffic speed control on both sides of the highway installed. Phase 1 design includes slurry of fines to reduce number of crossings required.	High
11	Personal injury	Heavy equipment impacting on OH HV power lines Increased site traffic Energy sources - electrical, air, hydraulic	Fatality	High vis signage around electrical equipment Operators trained in lockout / tagout procedures	High
15	Increased rehabilitation obligations	Application for new EA due to increased production plan	Delays in approvals Increased ERC bonding	Maintaining current disturbance footprints under both EAs	High
17	Pit retains mine affected water at the time of commencing the cutback	Big wet season	Delay in commencement of mining	Current dewatering process, readily escalated in need	High
20	Unknown pit stability on completion of dewatering and on cut into South Wall Fault	Unknown deterioration of rock face and geotechnical conditions	Potential safety incidents Pit wall failure	Plan for detailed geotech assessment before introductioin of people and equipment into the pit. Conservative rock bolting and face stability design included in operating costs.	High
22	Blasting impact on local community	Proximity to local community Location of magazine	Fly rock, dust, fumes, vibrations, etc Delays in approvals	Comprehensive Blast Management Plan to be developed, following detailed risk assessment	High
25	Waste rock may prove to not meet quarry rock spec	Higher sulphate	Additional areas required to separate mine waste from quarry waste rock Increased ERC	Planned geochemistry testwork and geological testing to ensure compliance with licensing requirements	High
26	Beneficial reuse comes into question	Policy change	Increased ERC	Received written direction from the State	High

A number of Medium and Low Risks have also been identified and included in the Project Risk Register and will be carried forward for consideration during subsequent stages of the Project. The Project Risk Register is a dynamic document, revised as appropriate to reflect changes as the project develops.

The key opportunities identified during the study are summarised in Table 31.

Table 31: Key Opportunities

Risk ID	Risk	Cause	Impact	Current Controls	Current Rating
29	Increased quarry revenue	Increased marketing By-products from process plant Large volumes of quarry inventory	Increase production revenue	Test work and R&D under way - suitable for road construction materials EOIs released	Significant
32	Potential reduction in the cost of funding	Potential NAIF and the Critical Minerals Fund	Lowest interest rate on debt	Meeting with Critical Minerals Facilitation Office planned for early October NAIF application process underway	Significant
35	Additional resource identification	Current cut off grade of resource model is 0.2%, changing cut off grade to 0.7% for a low grade feed similar to LGS could increase revenue and ore significantly	Increase in resource quantity and overall tungsten production from open pit	Plan to redo resource model with additional drill data to be obtained early 2022	Significant
37	Favourable geotechnical conditions on South Wall Fault found during future geotechnical investigation	A rock wall stabilising cost has been included in the operating estimate. Future geotechnical data may indicate a lower level of reinforcement is required to maintain wall stability.	Operating cost savings for pit wall stabilising.	A conservative design and costing is in place in the event that significant reinforcement is required.	Significant

A number of Medium and High Opportunities have also been identified and included in the Project Risk Register and will be carried forward for consideration during subsequent stages of the Project.

15. Ownership, Legal and Contractual

15.1. Tenure

Mt Carbine Quarries Pty Ltd, a wholly owned subsidiary of EQR, is the authorised holder of mining leases ML 4867 and ML 4919, with the boundaries shown in Figure 38 in relation to the existing site infrastructure. All operations on the Mt Carbine site are carried out by either Mt Carbine Quarrying Operations Pty Ltd or Mt Carbine Retreatment Management Pty Ltd (MTCRM) based on their operational areas. Mt Carbine Quarrying Operations Pty Ltd is 100% owned by EQR. Mt Carbine Retreatment Management Pty Ltd which is an unincorporated Joint Venture (JV) between EQR and CRONIMET Australia (Pty) Ltd (CRONIMET).

Figure 38: Mining Lease Boundaries

MTCRM is the operating company for the unincorporated JV between EQR and CRONIMET Australia. The JV was established for the funding and processing of the historic tailings at Mt Carbine and the 12,000,000t Low Grade Stockpile (LGS) and the recovery of the tungsten contained therein. As it is a 50/50 JV, funding for the establishment of the gravity processing plant, XRT Sorting Plant, earth moving fleet and ongoing operational costs have been carried by the JV since 2019 on an equal basis. Where either of the parties have carried additional costs, this has been accounted for in the accounts of the JV.

16. Investment Evaluation

16.1. Summary

Investment evaluation of the Project has been undertaken to support EQR in the determination of the viability of the Mt Carbine Expansion Project.

The overall valuation has been completed to the standard required by EQR to put forward the business case for an investment approval request and support the necessary project financing required to deliver the project.

A financial model for evaluating the Project has been created by Rock Financial Advisory (Rock), where the key outputs examined are net present value (NPV) and internal rate of return (IRR).

The financial model was created using the operational inputs from DAS Mining Solutions (DAS) received 6th of December 2021.

The key outputs from the model can be seen in Table 32:

Table 32: Investment Evaluation Key Outputs

Description	Financial Model
NPV (pre-tax and ungeared)	$131.5 million
IRR	154%
Payback Period	2.25 years (March 2024)
Discount Rate	8%

The macroeconomic, operational, and strategic factors presented in this section underpin the comprehensive financial model analysis completed for the basis of this economic study.

The economic model was developed to incorporate critical financial impacts required to undertake the development and operation of the project including estimated capital expenditures and deferred capital, revenues generated, operational expenditures, tax penalties, funding options, shareholders' returns, and project financial statement analysis.

Based on current assumptions data the project is estimated to generate cashflows of:

- $206m before any capex, tax or financing;
- $181m after adding on capex, and GST and equipment finance costs (which are akin to operating costs) and an NPV of $131m and an IRR of 154%. Expected payback (i.e. when cumulative cashflows turn positive) is in March 2024

A summary of the mining physicals, income statement and NPV analysis is presented in Table 34.

A strong pre-tax cash flow is driven by the cut back of the historic open pit and the ramp-up of mining and ore delivery from the open pit to the crushing and screening plant. Based on current modelling, the economics of the open pit peak in 2025 at a pre-tax cash flow of $95m, this is due to the low-grade strip ratio over this period combined with high-grade ore delivery.

On depletion of the current ore reserve accessible through open pit mining, that has been modelled for the purposes of this document, the intention of EQR is to extract the remainder of the ore reserves at Mt Carbine through underground mining activities. Limited work has been completed on the underground mining methodology to date, therefore, an additional study document is required to define the methodology and economics around this project expansion. Should an economic solution be defined for the potential underground ore reserves, the positive economics and strong cash flow is expected to continue and will be defined on completion of further work by the company.

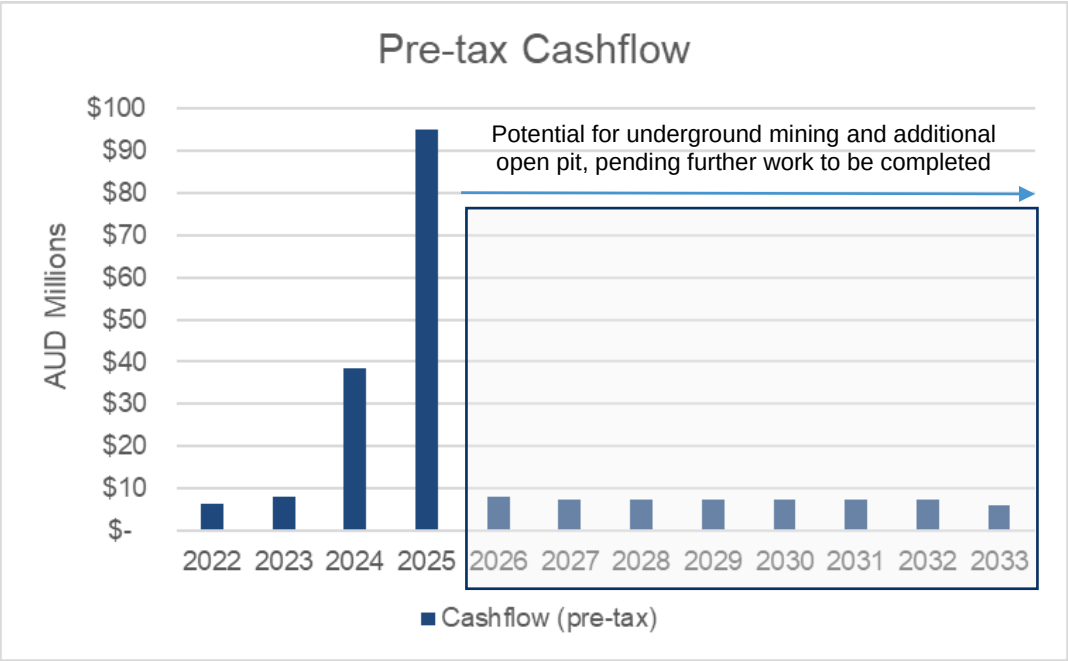


Figure 39: Pre-tax Cashflow for the Project

16.2. Methodology

The financial model was built on the deliverables and outputs of the DAS data. The valuation and the design were based on a 12-year life of mine, from 2022-2033 inclusive.

The feasibility study model by DAS was done on a deterministic basis. It includes scenario analysis and ranging and multiple variable sensitivities. This basis is considered an appropriate level of valuation to inform the final investment decision.

The financial model has been developed using the operational inputs from DAS, and then typical finance calculations added to arrive at a range of valuation measures as well as being a cashflow forecasting tool, which can show cash balances out to 2033. The parameters used in the financial model are summarised in Table 33.

Table 33: Financial Model Parameters

Item	Assumption
Valuation date	A valuation date of 31 December 2021 has been selected.
Inflation Rates	All data is in real dollars as at November 2021 i.e. no inflation has not been applied, thus no CPI index used
Discount Rate	The financial model presents various NPVs: • The pre-tax NPV uses a discount of 8.00% • The financial model then calculates post tax NPV, where the discount rate has been adjusted for a corporate tax rate of 25%, to arrive at 6.0%
Discount period	Over the LOM of 12 years i.e., 1 Jan 2022 to 31 December 2033
Revenue: Product Price (real) including any premiums or discounts	WO_3 APT Price USD = $31,500 APT payable = 70-75% Minimum Concentrate Grade = 50% Recovery through plant: Ore sorter product = 90%, and Fines = 79.5%
Royalty payable	2.7% of gross Tungsten revenue to Queensland State Government

Item	Assumption
	Paid to Traditional Owners: Nil Paid to other parties: Nil
Exchange Rates (Real)	1 AUD= 0.73 USD
Timing	LOM from 2022- 2033, being 12 years (2022 to 2033 inclusive), with Open Pit over only three years of 2023 to 2025 inclusive, and thereafter (2026 to 2033 inclusive), lower grade ore and quarry revenue continue All key capex spent in 2022
Corporate Income Tax	Corporate Income tax of 25% Carry forward tax losses as at time of writing of $21million
Native Title Compensation	No payments are applicable
Rehabilitation	A cost of $0.20/ tonne of open pit ore mined has been assumed
Debt	The funding required in 2022 has been modelled all as debt, as summarised below. Should an equity raising instead be the funding avenue, the post tax geared valuation outputs cited in this chapter will change • Approximately $4m of yellow goods and XRT Sorter under equipment finance at 5%, over 3 to 5 years • $21m of capex assumed to be funded by a $23m senior debt facility at 10%, and repaid over 5 years commencing in January 2023
Depreciation	Depreciation has been calculated as follows: • Accumulated depreciation and amortization at time of writing of $10.7m, which is further depreciated/amortized over 10 years • All other capex that is yet to be spent as detailed in earlier Capex section), is depreciated on a linear basis over 10 years

16.3. Financial Analysis

The Project Base Case is premised on a stand-alone project with a mine life of approximately 12 years. EQR will design, construct, finance and manage the project. The open cut mining is expected to be operated via a mining contractor who will provide all mining equipment and use EQR's mining fleet as suitable. The processing plants (crushing, screening and sorting plant and gravity processing plant) will be operated by EQR and will be a scale-up of ongoing operations with general site infrastructure being upgraded as required. Capital costs for the Project will therefore be limited with ample capacity to support a feed processing rate of 1 Mtpa, split between the LGS and the open cut mining operations.

This analysis has been based on the following assumptions:

- Mining method which operates open cut mining and low-grade stockpile mining;
- Average of 2,223 tpa of minimum 50% WO_3 concentrate sold on a FCA basis;
- Capital costs of $21.4M (real) ($22.9M including contingency);
- Tungsten concentrate production has an estimated C1 Cash Cost of $155/mtu (US$113/mtu) (real) steady state life of mine;
- Mining Costs broken down as follows:
    - Mining costs of $4.50/ ROM t (real), for mining of the open pit by a contractor;
    - LGS Mining for 24/hr operations at $2.47/t;

  - LGS Mining for 12/hr operations at $1.68/t;
- Mine closure and ancillary equipment at $0.20/t;
- Dry processing costs of $2.00/t (real) based on estimates provided as detailed in Chapter 13: Operating Cost Estimate;
- Ore sorting costs of A$1.06/t to ore sorters (real) based on estimates provided as detailed in Chapter 13: Operating Cost Estimate;
- Gravity processing plant costs of $11.00/t of feed (real) based on estimates provided in Chapter 13: Operating Cost Estimate with $0.34/t for tailings management;
- Other costs of $1.98/t (real) based on internal estimates, lease vehicles, grade control, sampling, drilling and lab testing, contractor mobilisation to site, maintenance facility cost and contractor demobilisation;
- Logistics and marketing costs are for the CRONIMET account and are reflected in the APT payable received for concentrates sold from the Project;
- Royalty costs of 2.7% of revenue based on current Government legislation;
- There are no private royalty costs associated with the project;
- Concentrate production with a minimum of 50% WO_3, within product specifications. As the project progresses and higher-grade ores are accessed, higher grade concentrates will be produced;
- Tungsten European APT price averaging US$315/mtu or US$31,500/t;
- APT payable = 70-75%;
- AUD / USD FX rate: 0.73:1;
- Base Price: calculated on a metric tonne unit (MTU) of WO_3 contained in a dry metric tonne delivered FCA Mt Carbine (INCOTERMS 2010);
- Index: London Metal Bulletin (LMB) European APT;
- Pricing: Low and High European APT averaged for the calendar month of delivery for the tungsten concentrate;
- APT payable: A floating payable is considered, covering the period under the fixed off-take contract with CRONIMET and for the period afterwards; and
- Payment terms: 95% payment upon delivery of product and 5% balance payment upon final settlement based on weighing and assay results.

Table 34: Mining Physicals, Income Statement and NPV

Outputs																
NPV from Fin. Mod	131,529			Year ending 31 Dec	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
NPV from DAS (A$m	156			Month for NPV	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	30-Jun-31	30-Jun-32	30-Jun-33
Lowest Cash (A$m)	1.740			Applicable FX	0.7300	0.7300	0.7300	0.7300	0.7300	0.7300	0.7300	0.7300	0.7300	0.7300	0.7300	0.7300
Sensitivities	are Off										Annual totals					
Error check this pa	OK															
Master error check	OK			LOM total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
UG Data (only affects this sheet if UG is turned on)																
Mineralised SP Fines	0.50															
UG Fines Split	0.50															
Mineralised SP XRT Feed	50%		percentage													
UG XRT Feed	50%		percentage													
Crusher feed Head Feed to Scalper																
Underground			tonnes	-	-	-	-	-	-	-	-	-	-	-	-	-
cumulative of row above			tonnes	na	-	-	-	-	-	-	-	-	-	-	-	-
Open Pit to Crusher			tonnes	1,041,229	-	94,698	416,576	529,956	-	-	-	-	-	-	-	-
cumulative of row above			tonnes	na	-	94,698	511,274	1,041,229	1,041,229	1,041,229	1,041,229	1,041,229	1,041,229	1,041,229	1,041,229	1,041,229
Screen Fines																
Screen Fines Underground			tonnes	-	-	-	-	-	-	-	-	-	-	-	-	-
Sorter Feed Underground			tonnes	-	-	-	-	-	-	-	-	-	-	-	-	-
Concentrate Production UG Sorter Fines			tonnes of con.	-	-	-	-	-	-	-	-	-	-	-	-	-
UG XRT Conc			tonnes of conc	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Concentrate Tonnages			tonnes of con.	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten Revenue- Underground			AUD$	-	-	-	-	-	-	-	-	-	-	-	-	-
Royalties-Underground				-	-	-	-	-	-	-	-	-	-	-	-	-
Mining Opex- Underground				-	-	-	-	-	-	-	-	-	-	-	-	-
Inputs (originally frm DAS sheet -some changed now)																
Concentrate Tonnages				26,677	1,203	3,016	5,644	8,008	1,253	1,204	1,190	1,203	1,203	1,203	1,203	946
WO3 APT Price USD	$ 31,500.00		USD$/ tonne of 100% WO3													
APT Payable	72.0%		percentage		70.0%	72.0%	72.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Concentrate Grade	50.0%		percentage													
Tungsten Revenue		425.15	AUD$	425,154,719	18,166,330	46,858,921	78,357,309	129,587,452	20,282,092	19,485,415	19,261,155	19,463,926	19,463,926	19,463,926	19,463,926	15,300,343
Tungsten Revenue- additional to match DAS				-												
Quarry revenue		11.70	AUD$	11,701,388	992,138	999,998	990,085	999,998	996,769	992,138	981,802	992,138	992,138	992,138	992,138	779,908
State Govt Royalty cost: Cash Flow Total ($M)	2.7%	- 11.4792	AUD$ -	11,479,177	- 490,491	- 1,265,191	- 2,115,647	- 3,498,861	- 547,616	- 526,106	- 520,051	- 525,526	- 525,526	- 525,526	- 525,526	- 413,109
Additional Opex: lab costs, geology sampling, grade control		- 29.9688	AUD$ -	29,968,829	- 1,968,700	- 3,821,500	- 3,404,500	- 3,029,500	- 2,411,500	- 2,161,500	- 2,161,500	- 2,161,500	- 2,161,500	- 2,161,500	- 2,161,500	- 1,899,129
OC Mining cost - Phase 3B: Cash Flow Total ($M)		- 3.6111	AUD$ -	3,611,103	- -	- 3,542,934	- 68,168	-	-	-	-	-	-	-	-	-
OC Mining cost - Phase 4B: Cash Flow Total ($M)		- 64.2299	AUD$ -	64,229,908	- -	- 20,051,399	- 24,905,895	- 19,207,940	- 84,674	-	-	-	-	-	-	-
LGS Mining cost - LGS1: Cash Flow Total ($M)		- 7.5425	AUD$ -	7,542,458	- 1,680,000	- 1,260,000	- 756,000	- 252,000	- 1,680,000	- 1,680,000	- 234,458	-	-	-	-	-
LGS Mining cost - LGS2: Cash Flow Total ($M)		- 9.4686	AUD$ -	9,468,628	- -	- -	-	-	-	-	- 1,428,000	- 1,680,000	- 1,680,000	- 1,680,000	- 1,680,000	- 1,320,628
Dry Processing cost: Cash Flow Total ($M)		- 22.7690	AUD$ -	22,769,036	- 2,000,000	- 1,897,234	- 1,741,275	- 1,566,516	- 2,012,212	- 2,000,457	- 1,979,165	- 2,000,000	- 2,000,000	- 2,000,000	- 2,000,000	- 1,572,176
Ore Sorting cost: Cash Flow Total ($M)		- 7.7149	AUD$ -	7,714,926	- 678,400	- 642,447	- 588,921	- 527,662	- 680,890	- 678,400	- 671,233	- 678,400	- 678,400	- 678,400	- 678,400	- 533,282
Gravity Plant cost: Cash Flow Total ($M)		- 52.5159	AUD$ -	52,515,940	- 4,452,725	- 4,488,000	- 4,443,511	- 4,488,000	- 4,473,509	- 4,452,725	- 4,406,338	- 4,452,725	- 4,452,725	- 4,452,725	- 4,452,725	- 3,560,237
Tailings cost: Cash Flow Total ($M)		- 1.6143	AUD$ -	1,614,303	- 137,228	- 137,712	- 135,659	- 136,038	- 137,858	- 137,228	- 135,798	- 137,228	- 137,228	- 137,228	- 137,228	- 107,873
Rehabilitation & Closure cost: Cash Flow Total ($M)		- 3.0152	AUD$ -	3,015,156	- -	- 1,048,037	- 1,109,958	- 858,086	- 2,874	-	-	-	-	-	-	-
FEL cost: Cash Flow Total ($M)		- 15.1119	AUD$ -	15,111,895	- 1,339,974	- 1,250,956	- 1,123,349	- 973,842	- 1,344,554	- 1,339,974	- 1,326,014	- 1,339,974	- 1,339,974	- 1,339,974	- 1,339,974	- 1,053,337
Ancillary cost: Cash Flow Total ($M)		- 0.9045	AUD$ -	904,547	- -	- 314,591	- 332,988	- 256,106	- 862	-	-	-	-	-	-	-
Cashflow (pre tax		206.92	AUD$	206,915,152	6,410,951.51	8,138,317.52	38,561,522.26	95,197,299.09	7,922,310.47	7,501,162.97	7,380,259.49	7,480,711.48	7,480,711.48	7,480,711.48	7,480,711.48	5,880,482.99

Potential for underground mining and additional open pit, pending further work to be completed

Financial Outputs																
Income Statement																
Phase 1 : Revenue			AUD$	425,154,719	18,166,330	46,858,921	78,357,309	129,587,452	20,282,092	19,485,415	19,261,155	19,463,926	19,463,926	19,463,926	19,463,926	15,300,343
Quarry Revenue			AUD$	11,701,388	992,138	999,998	990,085	999,998	996,769	992,138	981,802	992,138	992,138	992,138	992,138	779,908
UG-Revenue			AUD$	-	-	-	-	-	-	-	-	-	-	-	-	-
Royalties-Phase 1	2.70%	https://www.business.-	AUD$ -	11,479,177	- 490,491	- 1,265,191	- 2,115,647	- 3,498,861	- 547,616	- 526,106	- 520,051	- 525,526	- 525,526	- 525,526	- 525,526	- 413,109
Royalties-Underground	#VALUE!		AUD$	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Cut -all Opex			AUD$ -	218,461,777	- 12,257,026	- 38,455,411	- 38,670,224	- 31,891,290	- 12,808,904	- 12,450,283	- 12,342,646	- 12,449,826	- 12,449,826	- 12,449,826	- 12,449,826	- 9,786,659
UG Mining OPEX			AUD$	-	-	-	-	-	-	-	-	-	-	-	-	-
EBITDA			AUD$	206,915,152	6,410,952	8,138,318	38,561,522	95,197,299	7,922,310	7,501,163	7,380,259	7,480,711	7,480,711	7,480,711	7,480,711	5,880,483
Depreciation			AUD$ -	31,329,305	- 1,758,461	- 3,152,931	- 3,152,931	- 3,152,931	- 3,152,931	- 3,152,931	- 3,152,931	- 3,152,931	- 3,152,931	- 3,152,931	- 1,374,470	-
EBIT			AUD$	175,585,847	4,652,491	5,005,387	35,428,592	92,064,369	4,769,380	4,348,232	4,247,329	4,347,781	4,347,781	4,347,781	6,106,242	5,880,483
Interest accrued			AUD$ -	9,003,989	- 2,687,188	- 2,257,635	- 1,746,400	- 1,248,914	- 767,678	- 296,175	- 0	- 0	- 0	- 0	- 0	- 0
Profit / (Loss) Before Tax			AUD$	166,581,858	1,965,302	2,747,752	33,682,192	90,815,455	4,021,702	4,072,058	4,247,329	4,347,781	4,347,781	4,347,781	6,106,242	5,880,483
Tax payable(put in the month of FYE rather than date of cash payment)			AUD$ -	37,074,964	- -	802,061	- 15,563,143	- 11,854,645	- 1,012,384	- 1,054,298	- 1,074,389	- 1,086,945	- 1,086,945	- 1,220,848	- 1,584,245	- 735,060
Post Tax Earnings			AUD$	203,656,822	1,965,302	3,549,813	49,245,336	102,670,100	5,034,086	5,126,356	5,321,718	5,434,726	5,434,726	5,568,629	7,690,487	6,615,543
Tax Payable																
EBITDA			AUD$	206,915,152	6,410,952	8,138,318	38,561,522	95,197,299	7,922,310	7,501,163	7,380,259	7,480,711	7,480,711	7,480,711	7,480,711	5,880,483
less Depreciation -accumulated	10	2,431,906	-	2,431,906	- 243,191	- 243,191	- 243,191	- 243,191	- 243,191	- 243,191	- 243,191	- 243,191	- 243,191	- 243,191	-	-
less Depreciation- to be incurred (Calculations at right are simplistic and should be further refined according to years the individual items can be depreciated over)																
	10	20,617,046	-	20,617,046	- 687,235	- 2,061,705	- 2,061,705	- 2,061,705	- 2,061,705	- 2,061,705	- 2,061,705	- 2,061,705	- 2,061,705	- 2,061,705	- 1,374,470	-
less Amortisation - deferred exploration	10	8,280,353	AUD$ -	8,280,353	- 828,035	- 828,035	- 828,035	- 828,035	- 828,035	- 828,035	- 828,035	- 828,035	- 828,035	- 828,035	-	-
less Interest accrued			AUD$ -	9,003,989	- 2,687,188	- 2,257,635	- 1,746,400	- 1,248,914	- 767,678	- 296,175	- 0	- 0	- 0	- 0	- 0	- 0
Taxable Income			AUD$	166,581,858	1,965,302	2,747,752	33,682,192	90,815,455	4,021,702	4,072,058	4,247,329	4,347,781	4,347,781	4,347,781	6,106,242	5,880,483
Tax losses-Opening Balance				-	207,275,266	192,315,625	90,040,358	-	-	-	-	-	-	-	-	-
CFT Loss	21,000,000	per 30 June 2021 Annua	AUD$	21,000,000	21,000,000	-	-	-	-	-	-	-	-	-	-	-
Tax losses Added			AUD$	0	-	-	-	-	-	-	-	-	-	-	-	-
Tax losses used			AUD$ -	21,000,000	- 3,954,122	- 2,039,151	- 15,006,726	-	-	-	-	-	-	-	-	-
Tax Losses- Closing balance			AUD$	0	224,321,144	190,276,473	75,033,632	-	-	-	-	-	-	-	-	-
Taxable Income after tax losses utilised		145,581,858	AUD$	148,299,858	-	-	3,208,145	62,252,574	47,418,579	4,049,534	4,217,193	4,297,555	4,347,781	4,347,781	4,883,394	6,336,980
Tax payable for the FY		25.00%	AUD$	37,074,964	-	-	802,061	15,563,143	11,854,645	1,012,384	1,054,298	1,074,389	1,086,945	1,086,945	1,220,848	1,584,245
Tax payable for cashflow (have up to May following year to pay)				37,074,964	-	-	-	802,061	15,563,143	11,854,645	1,012,384	1,054,298	1,074,389	1,086,945	1,086,945	1,220,848
Free cash Flow & Cash balances																
Royalty & BAS flag																
Opening Cash balance			AUD$		2,500,000	8,014,085	7,004,157	38,188,943	126,480,269	113,524,018	103,813,131	110,183,439	116,607,431	123,013,754	129,407,520	135,801,286
Revenue	*from DAS*		AUD$	436,856,107	19,158,468	47,858,919	79,347,394	130,587,450	21,278,861	20,477,553	26,242,957	20,456,064	20,456,064	20,456,064	20,456,064	16,080,251
Royalties	*from DAS*		AUD$ -	11,479,177	- 490,491	- 1,265,191	- 2,115,647	- 3,498,861	- 547,616	- 526,106	- 520,051	- 525,526	- 525,526	- 525,526	- 525,526	- 413,109
Opex	*from DAS*		AUD$ -	218,461,777	- 12,257,026	- 38,455,411	- 38,670,224	- 31,891,290	- 12,808,904	- 12,450,283	- 12,342,646	- 12,449,826	- 12,449,826	- 12,449,826	- 12,449,826	- 9,786,659
Capex included in December 2021 BFS (including contingency)			AUD$ -	20,617,046	- 19,596,300	- 1,020,746	-	-	-	-	-	-	-	-	-	-
UG Opex			AUD$	-	-	-	-	-	-	-	-	-	-	-	-	-
GST added - Quarry revenue only	10.00%		AUD$	1,170,139	99,214	100,000	99,009	100,000	99,677	99,214	98,180	99,214	99,214	99,214	99,214	77,991
GST added BFS Opex			AUD$ -	21,846,178	- 1,225,703	- 3,845,541	- 3,867,022	- 3,189,129	- 1,280,893	- 1,245,028	- 1,234,265	- 1,244,983	- 1,244,983	- 1,244,983	- 1,244,983	- 978,966
GST re Capex above			AUD$ -	2,061,705	- 1,959,630	- 102,075	-	-	-	-	-	-	-	-	-	-
GST re UG Opex			AUD$	-	-	-	-	-	-	-	-	-	-	-	-	-
Return of GST			AUD$	22,737,744	2,237,378	3,759,971	3,762,396	3,258,850	1,658,155	1,154,665	1,138,517	1,143,348	1,145,769	1,145,769	1,145,769	961,948
Tax payable			AUD$ -	37,074,964	-	-	-	802,061	- 15,563,143	- 11,854,645	- 1,012,384	- 1,054,298	- 1,074,389	- 1,086,945	- 1,086,945	- 1,220,848
Asset Finance Tranche 1: 3 Dump trucks, one FEL. One 50t excavator, one D6 dozer			AUD$	-												
Asset Finance Tranche 1 Drawdown	31-Jan-22	1,800,000	AUD$	-	-	-	-	-	-	-	-	-	-	-	-	-
Asset Finance Tranche 1 Interest paid		5.000%	AUD$ -	131,250	- 68,750	- 46,250	- 16,250	-	-	-	-	-	-	-	-	-
Asset Finance Tranche 1 repayment	31-Dec-24	36.00	AUD$ -	1,800,000	- 600,000	- 600,000	- 600,000	-	-	-	-	-	-	-	-	-
Asset Finance Tranche 2: Sorter			AUD$	-												
Asset Finance Tranche 2 Drawdown	31-Jan-22	2,123,595	AUD$	-	-	-	-	-	-	-	-	-	-	-	-	-
Asset Finance Tranche 2 Interest paid		5.000%	AUD$ -	261,025	- 87,598	- 75,211	- 53,975	- 32,739	- 11,503	- 0	- 0	- 0	- 0	- 0	- 0	- 0
Asset Finance Tranche 2 repayment	31-Dec-26	60.00	AUD$ -	2,123,595	- 424,719	- 424,719	- 424,719	- 424,719	- 424,719	-	-	-	-	-	-	-
Senior Debt drawdown			AUD$	23,000,000	23,000,000	-	-	-	-	-	-	-	-	-	-	-
Senior Interest paid on debt			AUD$ -	6,141,622	- 2,060,759	- 2,126,175	- 1,676,175	- 1,216,175	- 756,175	- 296,175	-	-	-	-	-	-
Senior Debt repayment			AUD$ -	23,470,081	- -	4,600,000	- 4,600,000	- 4,600,000	- 4,600,000	- 5,070,081	-	-	-	-	-	-
Con. note interest	7.000%	3.00	AUD$ -	367,500	- 210,000	- 157,500	-	-	-	-	-	-	-	-	-	-
Equity Injection	tba		AUD$	-												
Distributions to Equity	tba		AUD$	-												
Closing Cash Balance			AUD$		8,014,085	7,004,157	38,188,943	126,480,269	113,524,018	103,813,131	110,183,439	116,607,431	123,013,754	129,407,520	135,801,286	140,522,194
Cashflow for the period (includes all cashflows above incl. financing and debt and equity)				135,928,058	5,514,085	- 1,009,927	31,184,786	88,291,326	- 12,956,251	- 9,710,887	6,370,308	6,423,992	6,406,323	6,393,766	6,393,766	4,720,908
Free cash flow before senior debt				144,567,272	- 15,215,157	5,883,747	37,460,960	94,107,501	- 7,600,076	- 4,344,631	6,370,308	6,423,992	6,406,323	6,393,766	6,393,766	4,720,908

Periods cash balance is negative

	Ever i.e. LoM	*2022*	*2023*
Min. cash balances	*1,740,070*	*1,740,070*	*7,083,480*
occurring :	*31-Jan-22*	*31-Jan-22*	*31-Mar-23*

Senior Debt		
The key inputs of debt amount and term of loan, can be changed below to affect the closing cash balance above		
Debt Quantum (A$m)	23	*Entered as one drawdown in amortisation table below, however could instead be a progressive drawdown over 2022 (in which case interest payable will be less)*
Drawn when	28-Feb-22	
Upfront Fee	2.50%	
Interest per annum	10.00%	
Repayment starts in month	31-Jan-23	repayment ends: 31-Dec-27
Over x years	5.00	
Monthly repayment (A$)	383,333	

Amortisation Table														
Opening balance	AUD$		-	23,470,081	18,870,081	14,270,081	9,670,081	5,070,081	- 0	- 0	- 0	- 0	- 0	- 0
Drawdown	AUD$	23,000,000	23,000,000	-	-	-	-	-	-	-	-	-	-	-
Repayment	AUD$ -	23,470,081	- -	4,600,000	- 4,600,000	- 4,600,000	- 4,600,000	- 5,070,081	-	-	-	-	-	-
Capitalised Interest and fees	AUD$	470,081	470,081	-	-	-	-	-	-	-	-	-	-	-
Closing balance	AUD$		23,470,081	18,870,081	14,270,081	9,670,081	5,070,081	- 0	- 0	- 0	- 0	- 0	- 0	- 0
DSCR: Debt Service Coverage Ratio - average	times	4.316												

NPV & IRR														
To match DAS : Pre TAx and no capital included														
CF to use		AUD$	206,915,152	6,410,952	8,138,318	38,561,522	95,197,299	7,922,310	7,501,163	7,380,259	7,480,711	7,480,711	7,480,711	5,880,483
Discount factor	8.00%													
NPV (using annual CF)	156,256,238	AUD$												
NPV from DAS	156,284,019				7,534,152	33,058,448	75,756,043	5,650,339	5,090,703	4,650,319	4,364,457	4,041,164	3,741,819	3,464,847	2,521,775
difference	27.781													
IRR	NA as there are no negative cashflows as capital is excluded from the DAS inputs													
Pre Tax and Impacted														
Assets under Equipment Finance are included (as are skin to operating costs) but Senior debt is not														
CF to use		AUD$	181,982,236	- 15,215,157	5,883,747	37,460,960	94,909,563	7,963,067	7,510,013	7,382,692	7,478,290	7,480,711	7,480,711	5,941,756
Discount factor	8.00%													
NPV (using annual CF)	131,522,560	AUD$												
IRR- monthly	154%	%												
Cumulative CF														
Payback occurs	31-Mar-24													
Post Tax and Geared														
CF to use		AUD$	135,928,058	5,514,085	- 1,009,927	31,184,786	88,291,326	- 12,956,251	- 9,710,887	6,370,308	6,423,992	6,406,323	6,393,766	6,393,766	4,720,908
Discount factor (adjusted for post tax)	6.00%													
NPV measured annually	110,510,620													
IRR- monthly	na													

16.4. Project Valuation

The Project is expected to generate discounted cash flows totalling $131.5m based on a discount rate of 8% (pre-tax), before considerations for project financing. The pre-tax, ungeared IRR of the project is expected to be 154% with payback by March 2024.

16.5. Sensitivity Analysis

16.5.1. NPV Sensitivity

The base case NPV is $131.5m.

The figure below illustrates the Project's NPV is most sensitive to the FX rate, and the tungsten price

The results were as follows:

- The AUD/ USD exchange rate has the most positive effect on the NPV, producing the highest NPV on the graph below of $209 million, when it is decreased by 20% (i.e. a weak AUD increases the AUD revenue). A 20% decrease in the base case AUD of 0.73 would be 0.58. A 10% decrease in the AUD is seen as more likely (resulting in AUD0.67, which was seen as recent as 2020), and that would increase the NPV by $34m, from the base case of $132m to $166m- as noted on the chart below;
- The following assumptions have the most negative effect, producing the lowest NPV of $69m (and thus they appear as one line on the graph below, however are lines on top of each other):
    - Tungsten recovery in process plant;
    - Tungsten price;
    - Concentrate grade; and
    - APT payable.

A percentage change in any of the above four inputs affects the NPV in the same manner.

Changes in capex have the least effect on the IRR, which is logical as capex is small at circa $20m, versus Revenue of $425m, thus percentage changes in assumptions that affect the latter will have a higher effect.

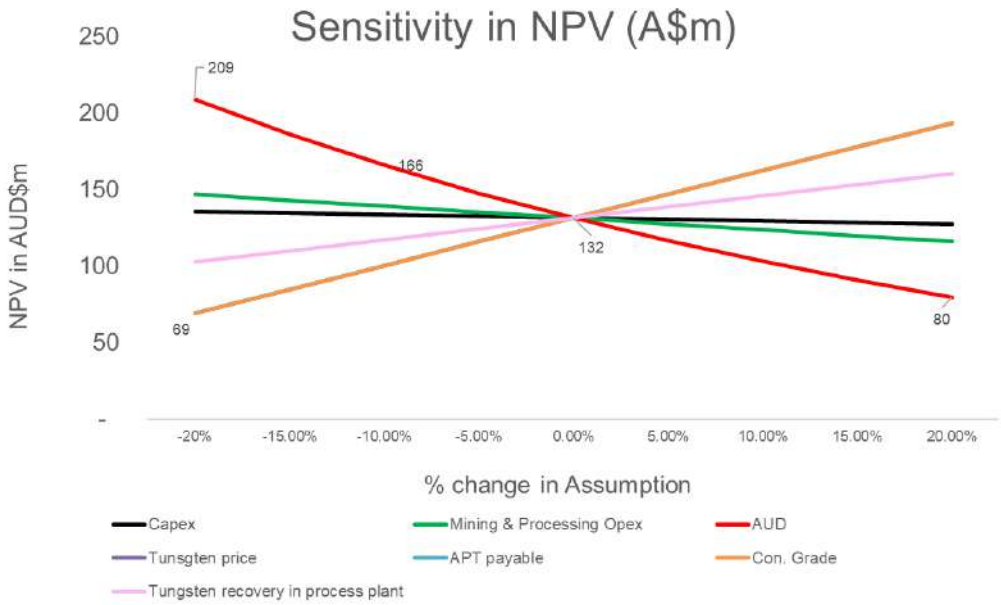


Figure 40: Sensitivity of the NPV to Changes in Key Assumptions

16.5.2. IRR Sensitivity

The base case IRR is 154%.

Changes in the NPV sensitivity inputs, had nearly exactly the same effect on the IRR as they did on the NPV, with the one exception being that a percentage change in the capex affects the IRR slightly more than a percentage change in opex does, as the IRR is calculated on monthly cashflows and the NPV on annual (both totalling the same, however more granularity in the monthly).

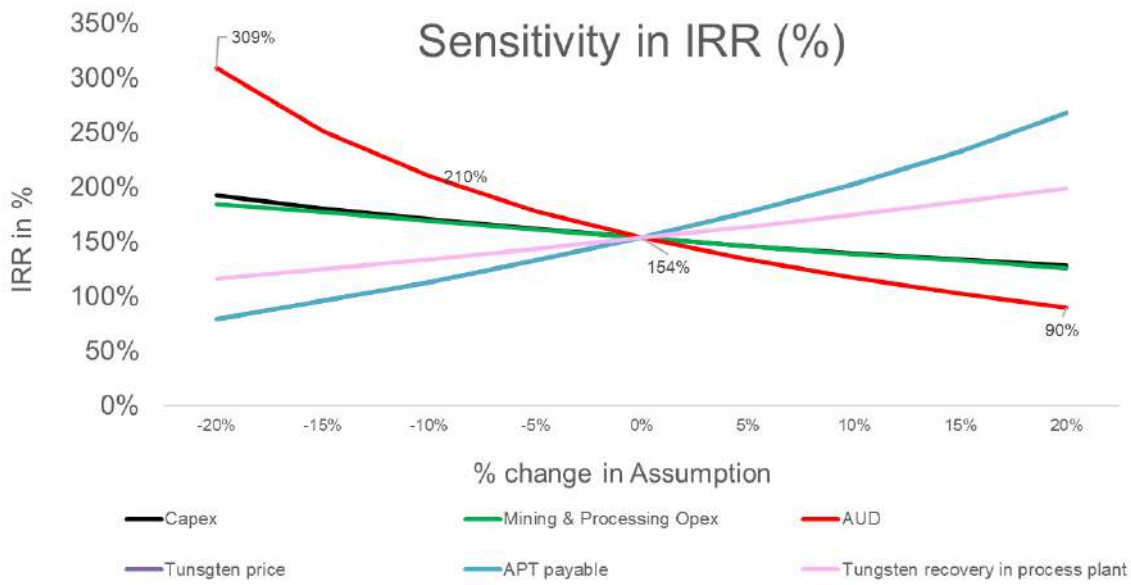


Figure 41: Sensitivity of the IRR to Changes in Key Assumptions

16.5.3. Breakeven Analysis

The model has been tested to determine the change required in key inputs to reach a “breakeven” level, by flexing / changing one input at a time.

A breakeven level can be defined numerous ways but for the purpose of this analysis, it’s defined as an IRR of 0% return.

All the inputs behave in the same manner as when testing for the NPV i.e. the inputs which the project is the most sensitive to (FX and revenue related inputs), require the least change to affect the IRR. For the IRR to decrease to 0%:

- the AUD would have to increase by 79% across all years. This would mean the AUD increasing from base case level of 0.73 to 1.422 (a level that has not been seen in 20 years);
- the tungsten price, or APT payable or concentrate grade or recovery rate would have to decrease by 45% across all years; or
- Conversely, the capex would have to increase by 881% (as it’s coming off a low base of only circa $20m).

The breakeven analysis is summarised in Table 35.

Table 35: Breakeven Analysis

Assumption	Change Required to reach IRR of Zero
Capex	881%
Mining & Processing Opex	192%
AUD	79%
Tungsten Price	-45%
APT Payable	-45%
Concentrate Grade	-45%
Tungsten Recovery in Process	**-45%**

17. Forward Work

17.1. Resource and Geology

17.1.1. Resource Model

The resource model that was developed for the feasibility study contains a cut-off grade of 0.2% WO_3 ore. There is significant opportunity to improve the quantity of ore identified in the open pit by remodeling the resource to include ore below the 0.2% WO_3 cut off. The processing facilities are being fed by the LGS with a grade of approximately 0.07%, so any waste identified in the current model between the LGS grade, and the current cut-off grade could be classified as ore and further improve the economics of the open pit operations.

17.1.2. Geotechnical Modelling

A greater understanding of the following geotechnical parameters is required prior to detailed pit design:

- Metasediments:
  - Structural dataset – defects within the rock mass both proximal and distal from the South Wall Fault and Iron Duke Fault;
  - Material strength parameters to allow for geotechnical analysis – again with spatial reference to the South Wall Fault and Iron Duke Fault; and
  - Groundwater – specifically porosity and permeability.
- Hornfels:
  - Further structural and material strength data to complement the existing historical dataset; and
  - Groundwater – porosity and permeability.
- Delineation of the South Wall and Iron Duke Faults – spatial location and material strength parameters.

17.2. Hydrogeology and Environmental Approvals

Hydrogeological and groundwater investigations are ongoing at Mt Carbine to support the approvals process as described in Chapter 10: Environment and Approvals.

The hydrogeology assessment will be conducted with additional input from water modelling consultants and geochemists to provide input into the development of the environmental approvals, that has already commenced, for Phase 1 and Phase 2.

17.3. Phase 3 Scoping Study

A scoping study for Phase 3 of the Mt Carbine complex development is planned to commence in early 2022. While this work will not directly impact the decisions or outcomes for the open cut operations, it will progress the future work planning for Mt Carbine and progress the process to supplement high grade ore for the operations and the completion of the open pit mining.

17.4. Project Readiness

EQR will continue to work with its project management partners to prepare for the commencement of the Project. Early works have commenced on the site prior to the completion of the feasibility study to ensure Phase 1 timelines are maintained. EQR will continue to progress the planning works required to commence the detailed design and construction activities as outlined in Chapter 7: Project Execution.

18. List of Abbreviations

Abbreviation	Description
ADT	Articulated dump truck
ALARP	As low as reasonably practicable
APT	Ammonium paratungstate
Capex	Capital expenditure
CEO	Chief Executive Officer
CMOC	China Molybdenum Co Ltd
CPI	Consumer Price Index
CRONIMET	CRONIMET Australia Pty Ltd
CSEP	Community and Stakeholder Engagement Plan
E&I	Electrical and instrumentation
EMRS	Environmental Monitoring and Reporting System
EOW	End of waste
EP	Environmental Program
EPC	Engineer, procure, construct
EQR	EQ Resources Limited
ESG	Environment, Social Governance
FCA	Free carrier
GHG	Greenhouse gas
HGZ	High-grade ore zone
IMS	Integrated Management System
IMSM	Integrated Management System Manual
JORC	Joint Ore Reserves Committee
JT	JukesTodd
JV	Joint venture
LGS	Low grade ore stockpiles
LMB	London Metal Bulletin
LOM	Life of mine
ML	Mining Lease
MTCRM	Mt Carbine Retreatment Management Pty Ltd
MTU	Metric tonne unit - one mtu equates to 10kg. The term is used as the pricing basis for APT

Abbreviation	Description
Opex	Operating expenditure
RL	Relative level
SCADA	Supervisory control and data acquisition
SDG	Sustainable Development Goals
SHMS	Safety and health management system
SMP	Structural, mechanical, piping
SSE	Site Senior Executive
W	Tungsten
XRT	X-ray transmission

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