



NORTHERN STAR  
RESOURCES LIMITED

# KCGM Site Visit Presentation

July 2022



# Forward Looking Statements, Reserves and Resources



## Forward Looking Statements

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## ASX Listing Rules Disclosures

This announcement contains current estimates of Northern Star's KCGM Operations' Ore Reserves and Mineral Resources. The information in this announcement that relates to the current Ore Reserves and Mineral Resources, and production targets of Northern Star has been extracted from the ASX release by Northern Star entitled "Resources, Reserves and Exploration Update" dated 3 May 2022 available at [www.nsr ltd.com](http://www.nsr ltd.com) and [www.asx.com](http://www.asx.com) ("Northern Star Announcement").

Northern Star confirms that it is not aware of any new information or data that materially affects the information included in the Northern Star Announcement other than changes due to normal mining depletion during the four month period to 31 July 2022, and, in relation to the estimates of Northern Star's KCGM Operations' Ore Reserves and Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the Northern Star Announcement continue to apply and have not materially changed. Northern Star confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from that announcement.

Assumptions made in relation to the Ore Reserves and Mineral Resources underpinning the production targets in that announcement are (in summary):

- Current operational capital and operating cost structures,
- Current mining and metallurgical performance,
- The gold price, exchange rate, dilution allowance and mining recovery rates are as set out in each prior public report referred to in ASX Listing Rule 5.19 disclosures, and
- 5 year gold production profiles are based on 100% current JORC compliant Ore Reserves.

Rounding is applied in this presentation for the percentage comparisons and for the 31 March 2022 Ore Reserves and Mineral Resources figures.

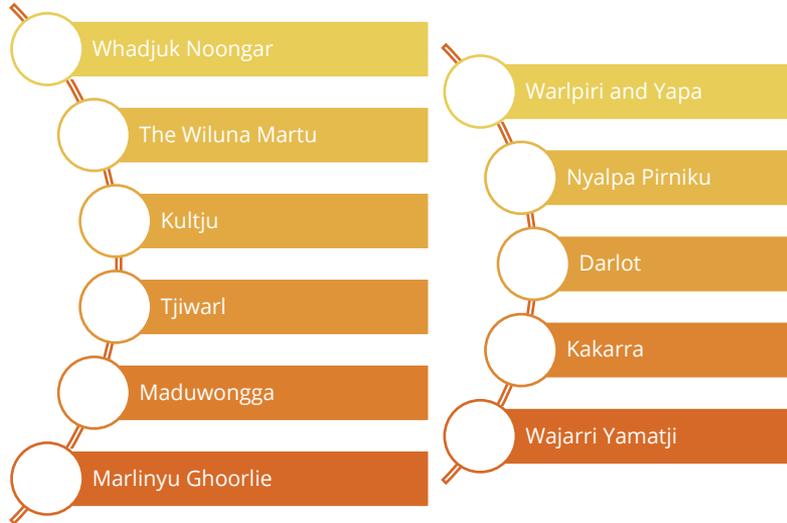
Unless stated otherwise, all currency conversions in this document have been converted at a currency of A\$/US\$ conversion rate of \$0.75.

Authorised to release to the ASX by Stuart Tonkin, Managing Director & CEO.

# Acknowledging our landowners

Northern Star would like to acknowledge and pay our respects to Traditional Owner groups whose land we are privileged to work on, and whose input and guidance we seek and value within the operation of our business.

We acknowledge their strong and special physical and cultural connections to their ancestral lands.



Northern Star would like to acknowledge Doyon Limited, whose traditional lands surround our Pogo Operation in Alaska, USA



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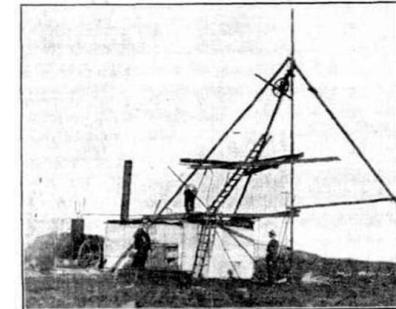
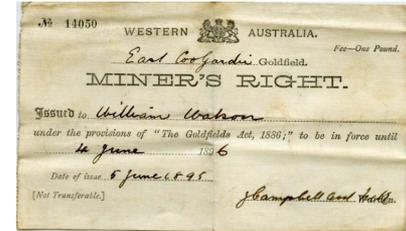
# KCGM OPERATIONS



# KCGM: Rich in history

- The 1893 gold rush (initiated by Paddy Hannan), resulted in the discovery of the Golden Mile
- In 1903 there were 49 operating mines, 100 headframes and more than 3,000km of underground workings on the Golden Mile
- In the 1980's, consolidation aspirations to a single company failed
- By 1989, the entire area was combined and Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM) was formed, a joint venture between Normandy Australia Ltd and Homestake Gold of Australia Ltd
- All underground operations were phased out except for the Mt Charlotte Underground Mine, and the Fimiston and Gidji processing plants were constructed
- In February 2021, following merger of Northern Star and Saracen Mineral Holdings Ltd, KCGM now 100% Australian-owned for the first time in its 31-year history

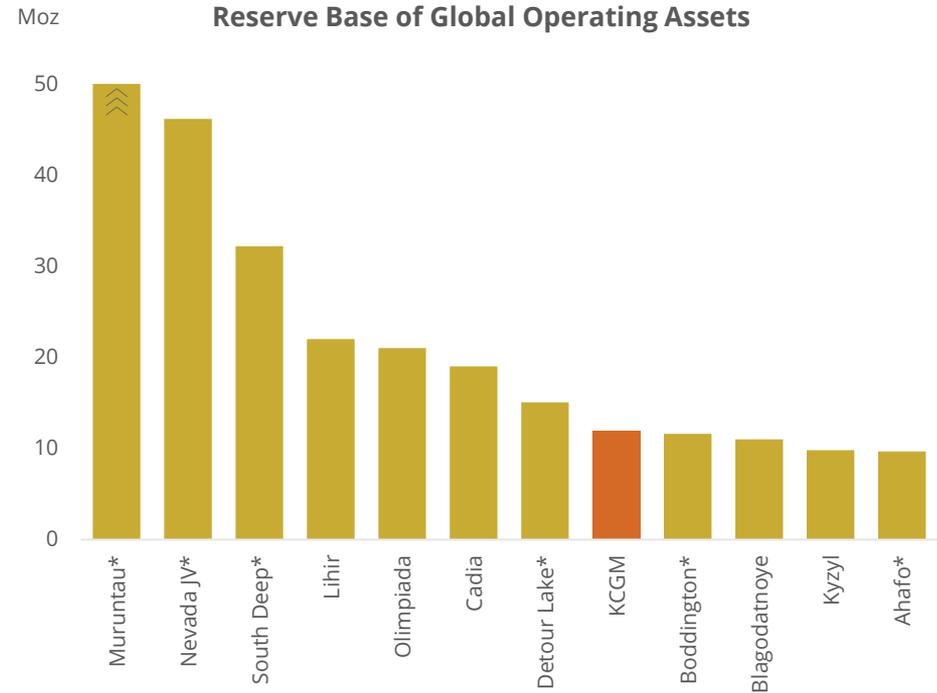
**Produced +65Moz gold since first production in 1893**



*Diamond Drilling on the Golden Mile*  
The Golden Mile Block 45 company is putting down its first diamond drill hole on its lease at the northern end of the Golden Mile. The manager (Mr. R. Warrick) is seen on the left.

# KCGM: One of the world's most significant gold mines

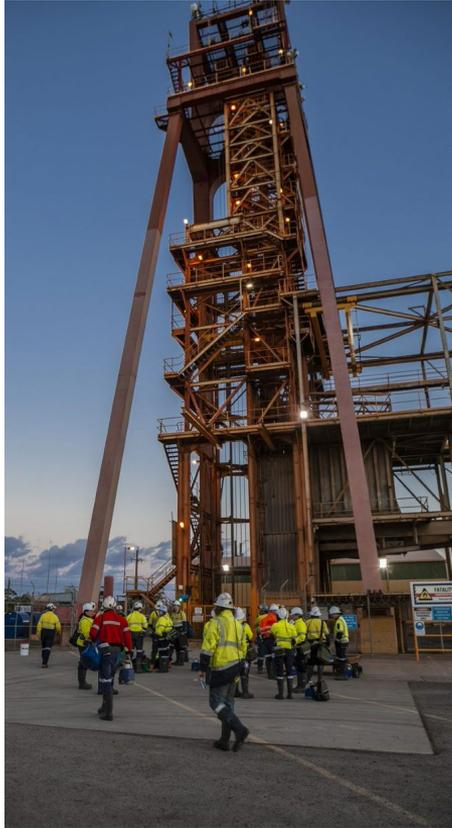
- A Tier-1 world-class gold operating asset; 100% ownership
- Ranked Top 8 globally by Reserve\*  
(27.4Moz Mineral Resource & 11.9Moz Ore Reserve)
- 297km<sup>2</sup> of tenure, hosting +30km of the Boulder-Lefroy structural corridor
- On track to deliver 650kozpa by FY26



Asset Reserves are reported in accordance with the JORC Code 2012, unless otherwise noted by an asterisk.

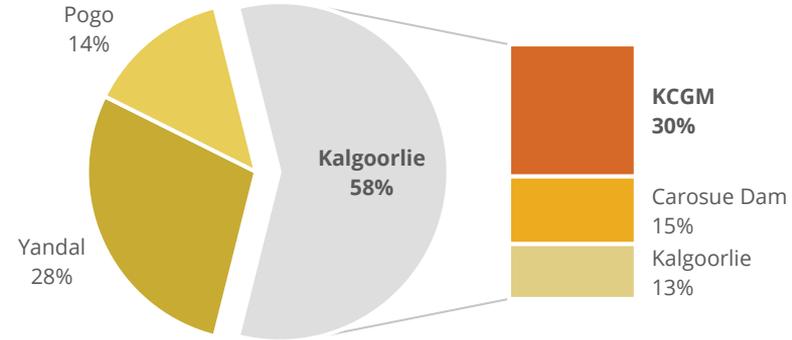
\* Nevada JV, Boddington, Ahafo Reserves have been prepared in accordance with the new Regulation S-K 1300 requirements; Detour Lake Reserves prepared in accordance with the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101"); South Deep Reserves prepared in accordance with the South African code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves, 2016 edition (SAMREC Code); Muruntau Reserves prepared in accordance with the former Soviet system for classification of Mineral Resources & Reserves.

# KCGM: Size and scale



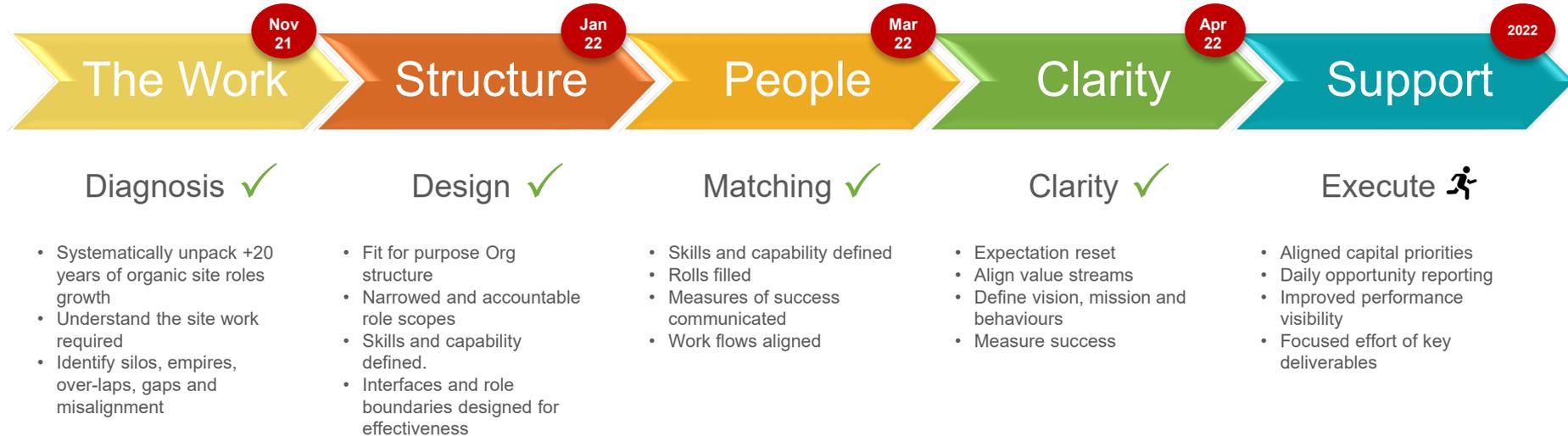
- Residential workforce of 857 ( 34% Female | 66% Male)
- 66Mtpa material movement, increasing to 80-100Mtpa
- 39 new CAT 793F haul trucks, plus 6 upgraded 793F trucks for a total fleet of 45
- 2 new Komatsu PC-8000 shovels with various ancillary equipment all commissioned

Production by site (%)



# KCGM: Business First

The right high performance organisation to do the work



Aligned vision to company level  
- focus on value over volume -

# Connecting with our Community



Working with our local and regional communities to achieve mutually beneficial partnerships and sustainable long term social benefits

- Community & Inclusion
- Health & Wellness
- Environment
- Indigenous Advancement
- Education & Development



Children's Health Research



Goldfields Indigenous  
Tertiary Scholarships



Medical, Dental and  
Urgent Air Children's  
Health Research  
Ambulance support

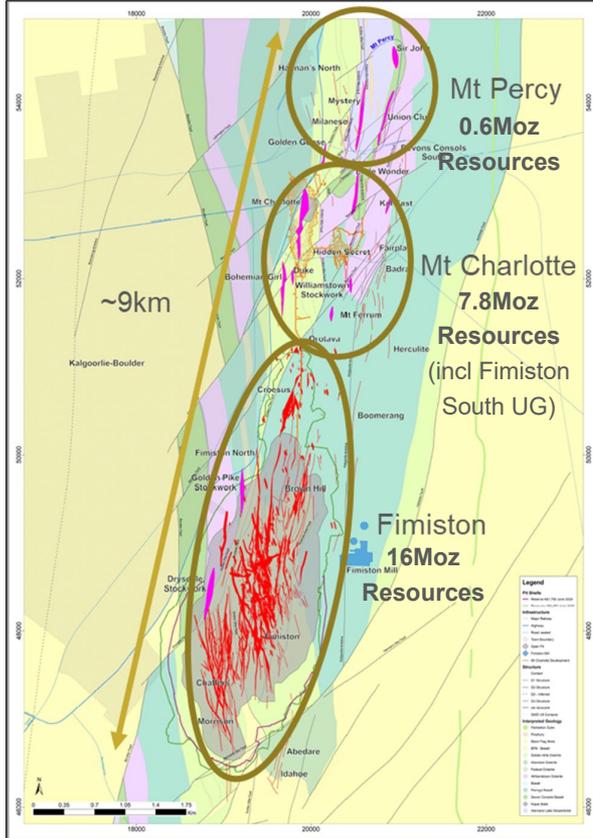


Perth Lynx Major Partner &  
Community Partner of  
Basketball WA

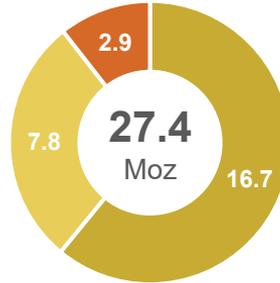


GEOLOGY -  
Our continuous improvement journey

# World-Class Resource Base



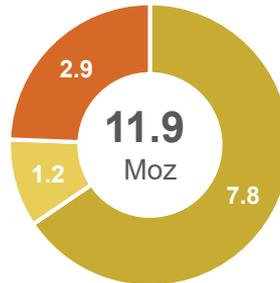
## Resource



- Open Pit
- Underground
- Stockpile

- Large surface stockpiles
  - 123Mt ore (2.9Moz Reserves)
  - No cash mining costs

## Reserve



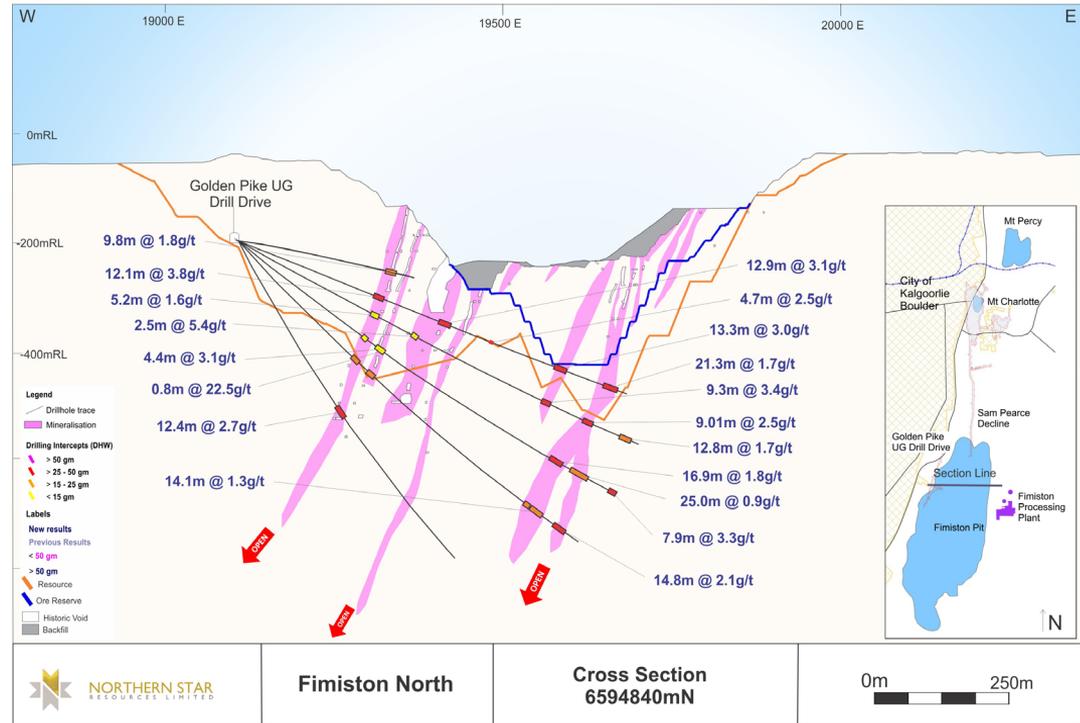
- Open Pit
- Underground
- Stockpile

- Resource Model enhancements
  - Improve scheduling of additional ore tonnes
  - Slower than expected depletion of stockpiles

# Fimiston North

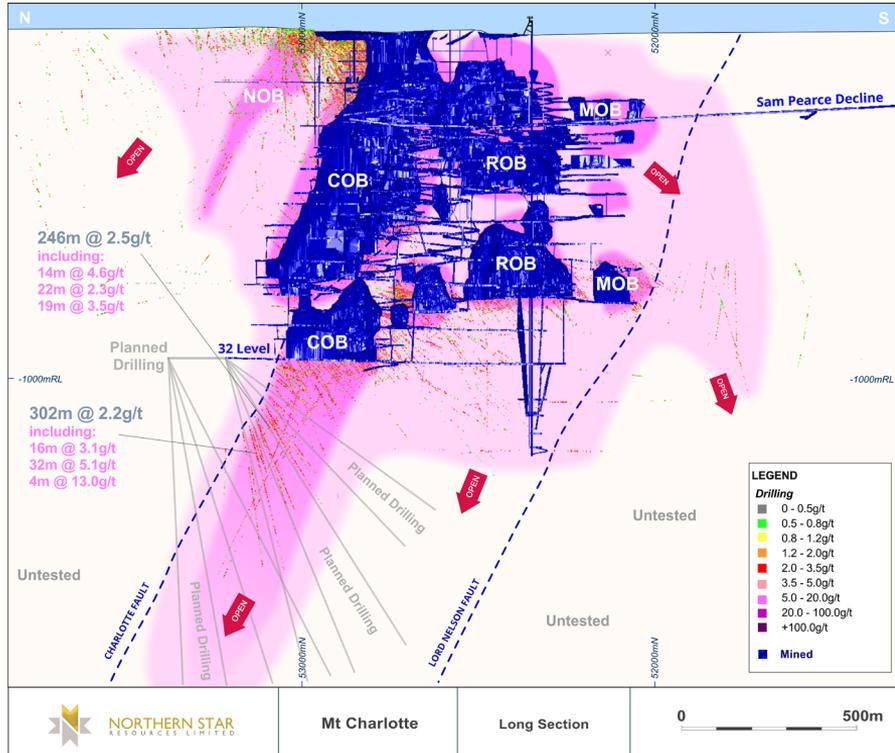
- Mineral Resource increased by 20% (YoY) to 5.0Moz; Drill results including **4.7m @ 22.9g/t**, **12.1m @ 3.8g/t**
- Lodes remain open to the north and down dip
- First underground portal in the Super Pit in almost 25 years
- Historic underground workings extend 1.4km below surface with historic drilling intersecting mineralisation at depths more than 2km
- Underground drilling has successfully drilled through multiple voids allowing for greater testing of this highly prospective area

## New Underground Portal, Golden Pike Drill Drive



# Mt Charlotte

## Planned 32 Level Drilling, Mt Charlotte

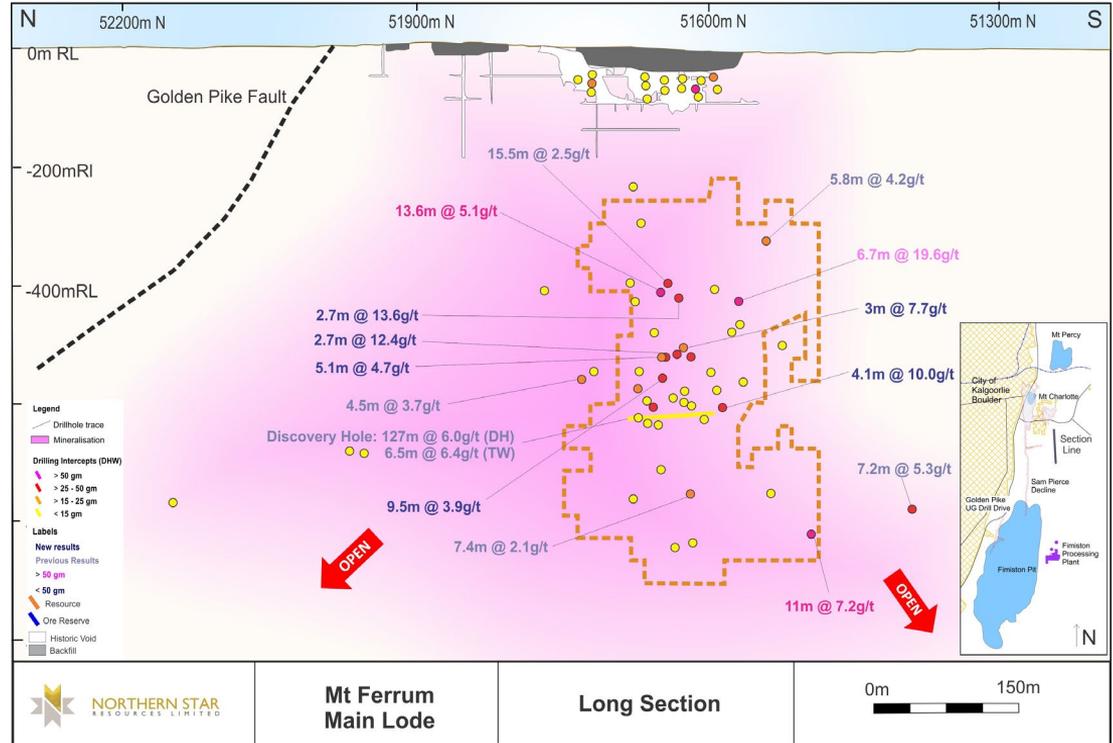


- 3km north of the Fimiston processing plant
- Significant potential to expand multiple areas adjacent to existing mine infrastructure
- 28% increase (YoY) in Ore Reserves to 1.2Moz, after depletion
- At depth;
  - Main COB Orebody remains open
  - Future extensional drilling to significantly expand the down-plunge position of the main Charlotte orebody (drill results: **246m @ 2.5g/t and 302m @ 2.2g/t**)

# Mount Ferrum

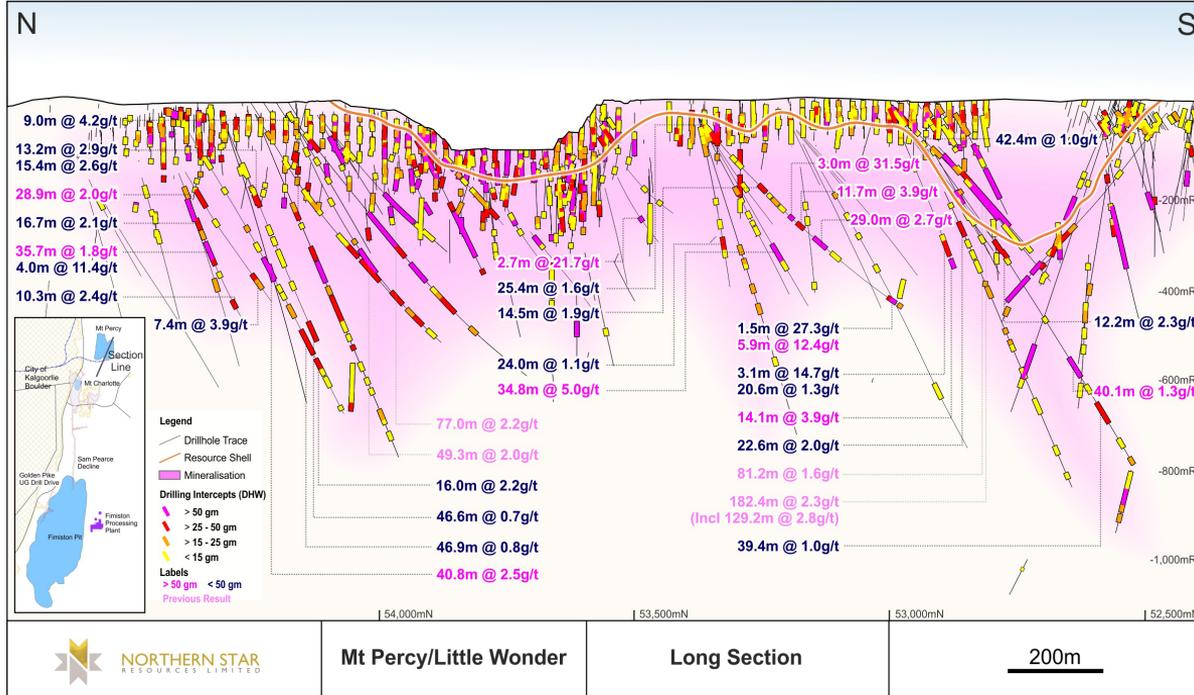
- Multiple stacked zones of Fimiston-style mineralisation located east of Mt Charlotte
- South to Hidden Secret mining area, 500m east of the Sam Pearce Decline
- New dedicated drill drive established
- Infill drilling will continue across FY23 with potential mining activities anticipated to commence in FY25

Mount Ferrum Main Lode Long Section, New Drill Results



# Mount Percy - Little Wonder

Mount Percy Long Section, New Drill Results

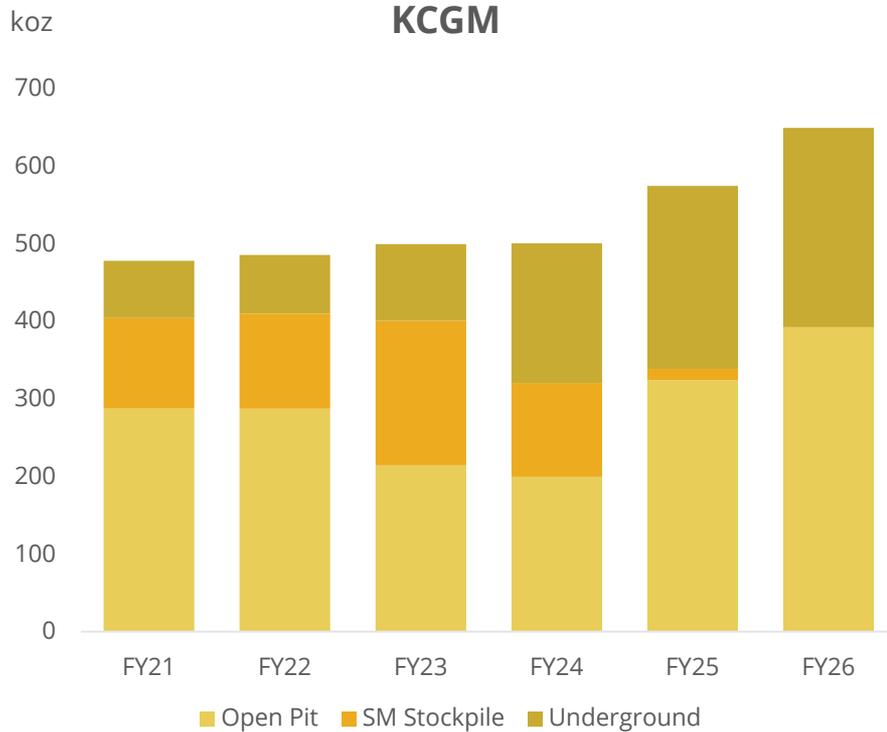


- 4km north of the Fimiston processing plant
- Multiple mineralisation styles in multiple host rocks
- Targeting bulk tonnage stockwork mineralisation over large area
- Initial drilling delivered 100% resource increase, outstanding long-term exploration potential of this northern corridor
- Mount Percy not included in LOM plan



OPEN PIT -  
Our continuous improvement journey

# Optimisation Phase 1: Pathway to 650kozpa by FY26



## Pathway to 650kozpa by FY26 remains unchanged

- Fleet delivery complete and commissioned
- Material movement increasing to 80-100Mtpa
- Access to Golden Pike North a key driver for low cost ounces due to strip ratio
- Underground continues to ramp up
- Ore stockpiles continue to increase over this timeframe
- Regional synergies and production growth enable lower AISC position

# Optimisation Phase 1: Fleet delivery complete

## Fleet delivery – complete and commissioned

- 39x 793F trucks
- Upgraded 6x 793F trucks
- 2x PC-8000 Shovels
- 994 Loader plus dozers and ancillary equipment



## 793F trucks

- 5% better fuel efficiency with increased tonnes per hour
- 90% availability
- Average speed on grade increased from 11.8km/hr (793C) to 14km/hr (793F)



# Optimisation Phase 2: Near term focus

- Key mining areas:
  - OBH (East Wall) in order to access Golden Pike North
  - Great Boulder for long term ore source
  - Golden Pike South primary ore source FY23
- Material movement of 80-100Mtpa over FY23-26
  - FY22a: 66Mtpa
  - FY23: +30% YoY
  - FY24: peak material movement year

KCGM Production Profile	FY22	FY23	FY24	FY25	FY26
<b>Open Pit</b>					
Oroya Brownhill					
Fimiston South Stage 1					
Golden Pike South					
Fimiston South Stage 2					
Golden Pike North					
<b>Underground</b>					
Mount Charlotte					
Fimiston North*					
<b>Stockpiles</b>					
Reserve Stockpiles					



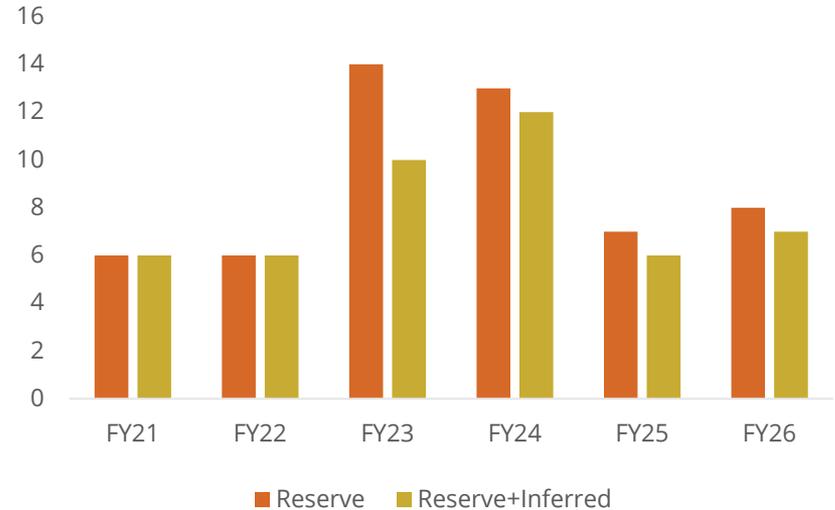
\* Currently not in mine plan

# Optimisation Phase 2: Lowering strip ratio

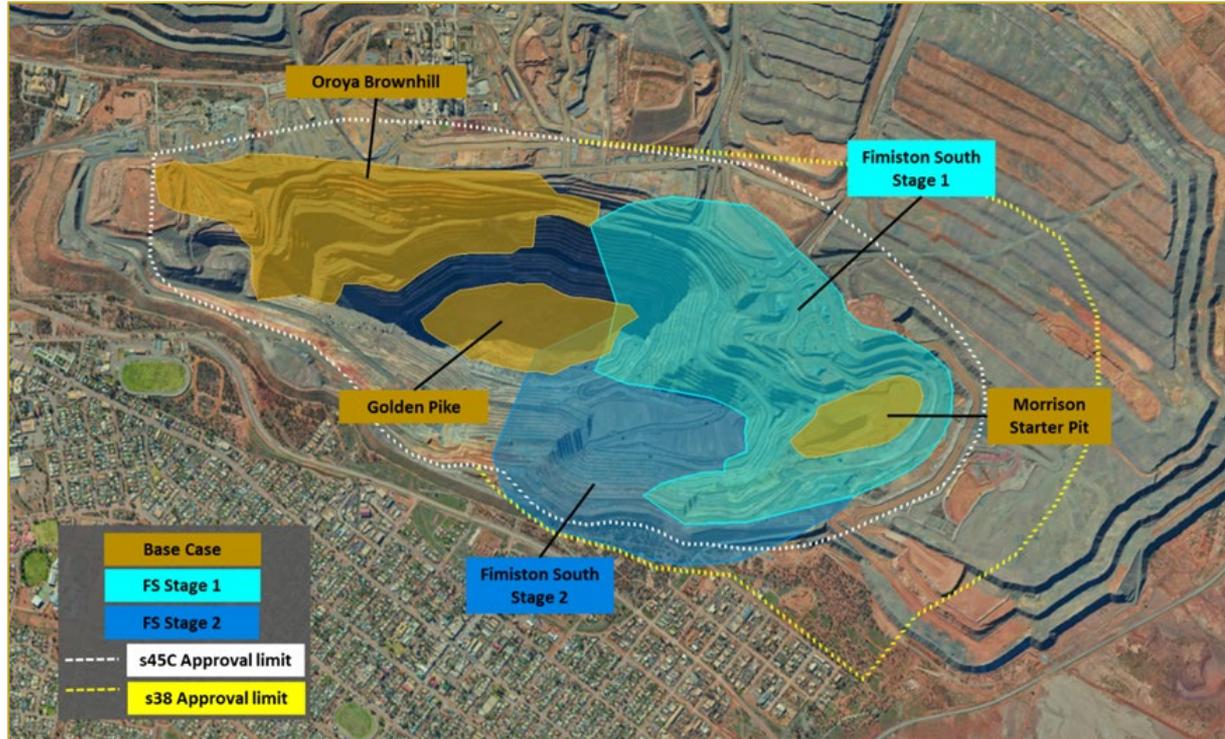
- 9:1 Life of Mine strip ratio (including Inferred)
- Fimiston South Stage 1 waste movement expected to drive step change in strip ratio FY23 & FY24
- Inferred ore tonnes will be drilled to indicated status, providing a potential additional 7M ore tonnes over FY23-FY26



Strip Ratio



# Optimisation Phase 3: Fimiston South Stage 2



## Fimiston South cut-backs

### Stage 1 (in progress)

- 47Mt moved FY21-22
- Large benches and space opening up as a significant optimisation opportunity

### Stage 2

- S38 submission on track for Q1 FY23
- FY24 approval

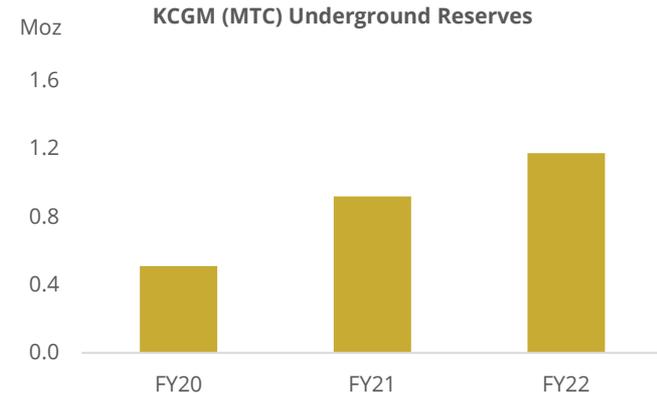
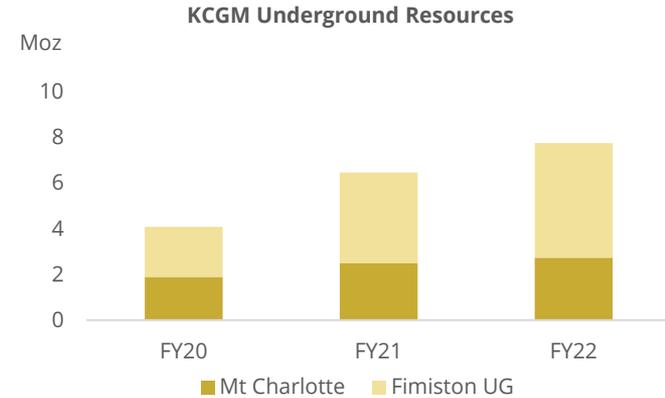


UNDERGROUND -  
Our continuous improvement journey

# Underground Mineral Resource and Ore Reserve growth

Exploration success provides platform for underground production growth

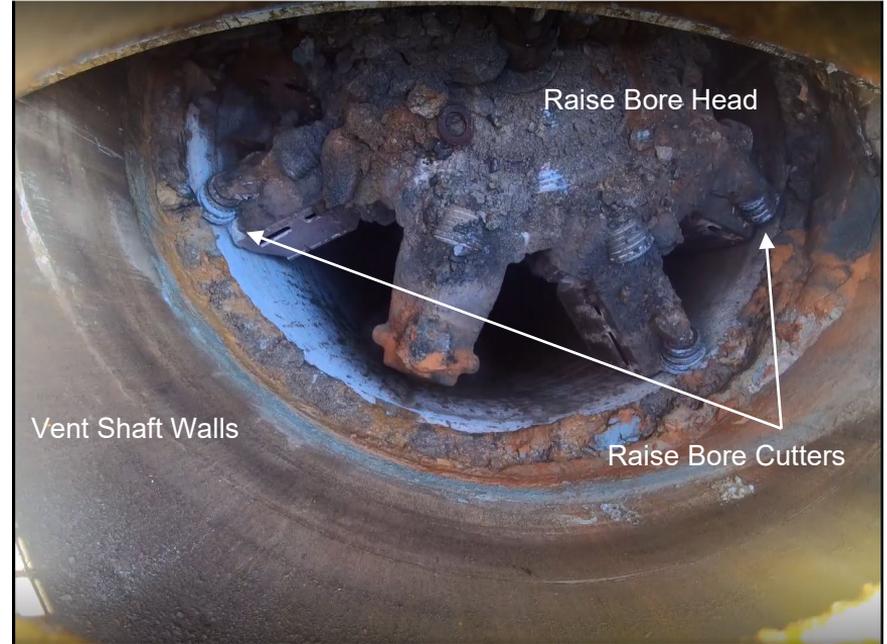
- Underground Mineral Resources of 104Mt @ 2.3g/t for 7.8Moz (+20% YoY)
- Underground Ore Reserves of 17.9Mt @ 2.0g/t for 1.2Moz (+28% YoY)
- Exploration focus drives increase at both Mt Charlotte and Fimiston
- Mt Charlotte endowment range 4,300oz per vertical metre
- Fimiston lodes endowment range 45,000oz per vertical metre
- Future opportunity to advance KCGM Revival:
  - Mining Studies; Fimiston Nth, Mt Ferrum, Fairplay, Little Wonder, Duke
  - Infrastructure; Materials handling options (including review of Mt Charlotte shaft haulage)



# Mt Charlotte: Production growth lever

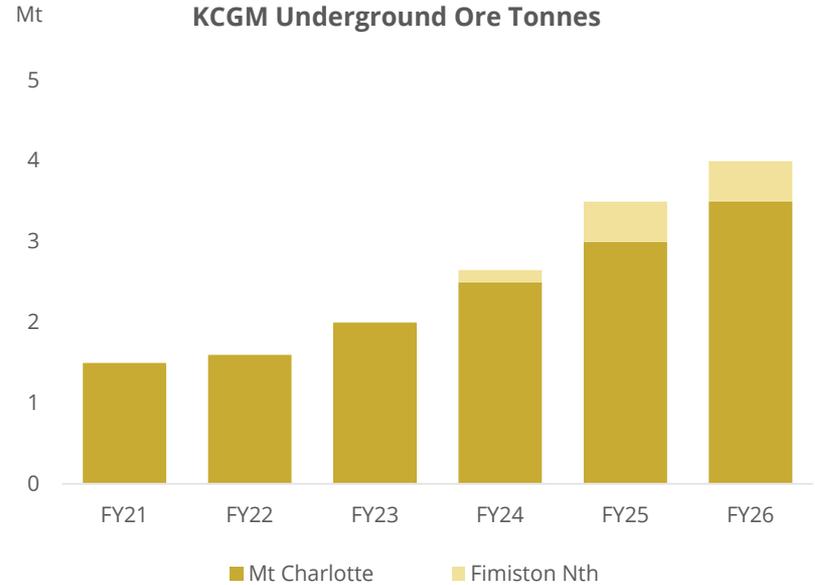
- Mt Charlotte has produced over 5.6Moz at an average grade of 3.5g/t
- Mining continues to deliver quality ounces at expected operating costs
- Focus areas:
  - Delineate gold lodes
  - Develop new mining areas to support multiple mining fronts
  - Rehabilitate old development areas
  - Provide suitable infrastructure (power, services) to support future mining activities
- 24 / 7 development and production activities mined by Northern Star Mining Services (NSMS)

Overhead View of new Fair Play Vent Shaft taken during breakthrough video



# KCGM Underground production growth

- Mt Charlotte continues to demonstrate strong growth in underground productivity
- Increasing contribution from higher grade ore (2.0g/t), displacing lower grade stockpile feed (0.7g/t)
- Ongoing underground diamond drilling at both Mt Charlotte and Fimiston North (grade control, resource definition and exploration)
- Feasibility Study planned for Fimiston North during FY23, pending results, initial development planned FY24



KCGM Production Profile	FY22	FY23	FY24	FY25	FY26
Underground	■				
Mt Charlotte	■	■	■	■	■
Fimiston North			■	■	■

# Northern Star Mining Services: A strategic advantage

- NSMS began providing services at KCGM in November 2020, new management team and new fleet injected
- Current fleet:
  - 2 x Sandvik DD421 & 1 x Sandvik DD422i Jumbo
  - 2 x Epiroc Simba E7C Longhole
  - 6 x Sandvik LH517i Loaders
  - 7 x Sandvik TH663i Trucks
- Immediate productivity improvements realised and continue to do so. Highlights include:
  - June 2022 front line jumbo performance +42K drill metres (pre-NSMS takeover 15K drill metres)
  - June 2022 +130K TKM per truck (vs industry average 80K-100K TKM)
  - Millennium World Record Crew completed 2.2km of Golden Pike drill drives in 6 months (single heading)



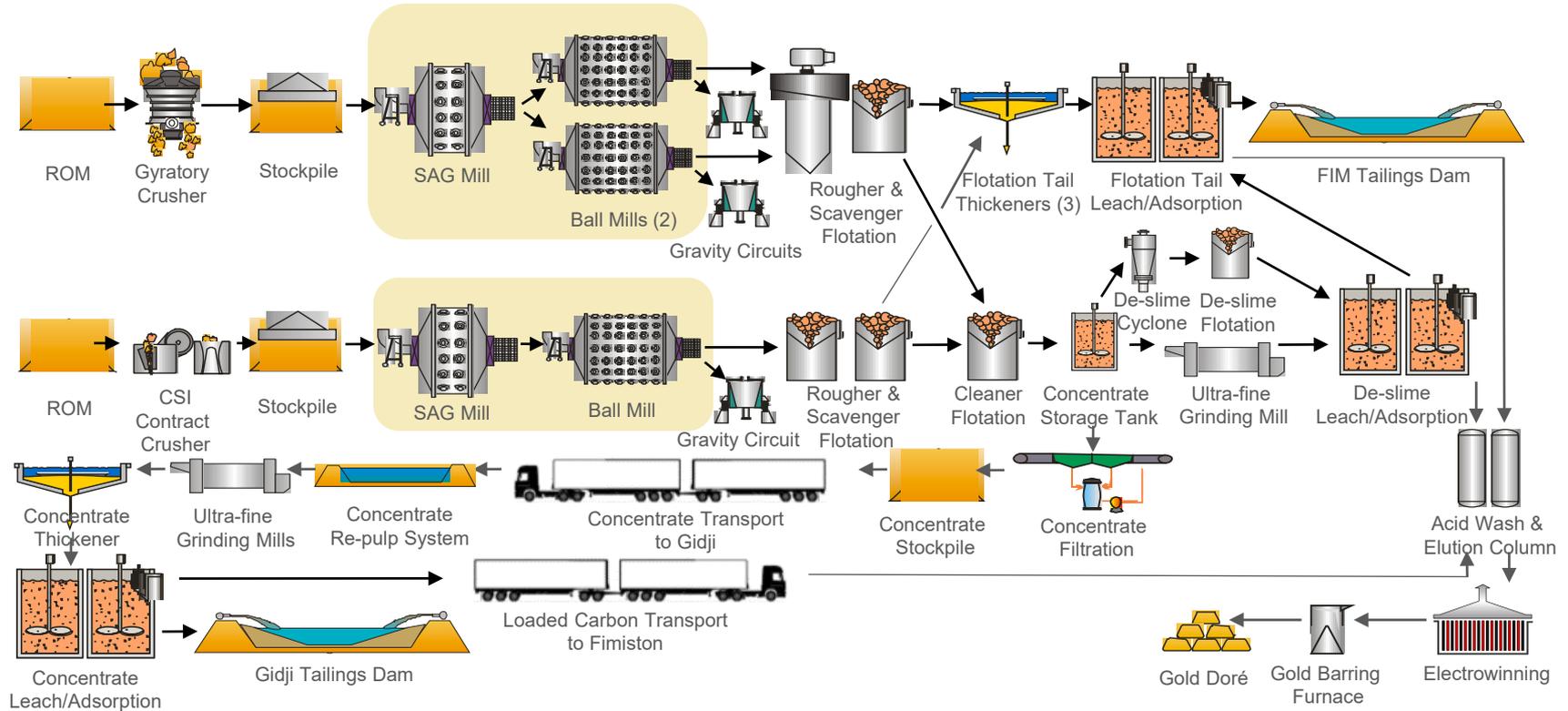
Further supporting growth at Mt Charlotte, new NSMS Operations & Training Centre (above) located on Boulder Road, South Kalgoorlie



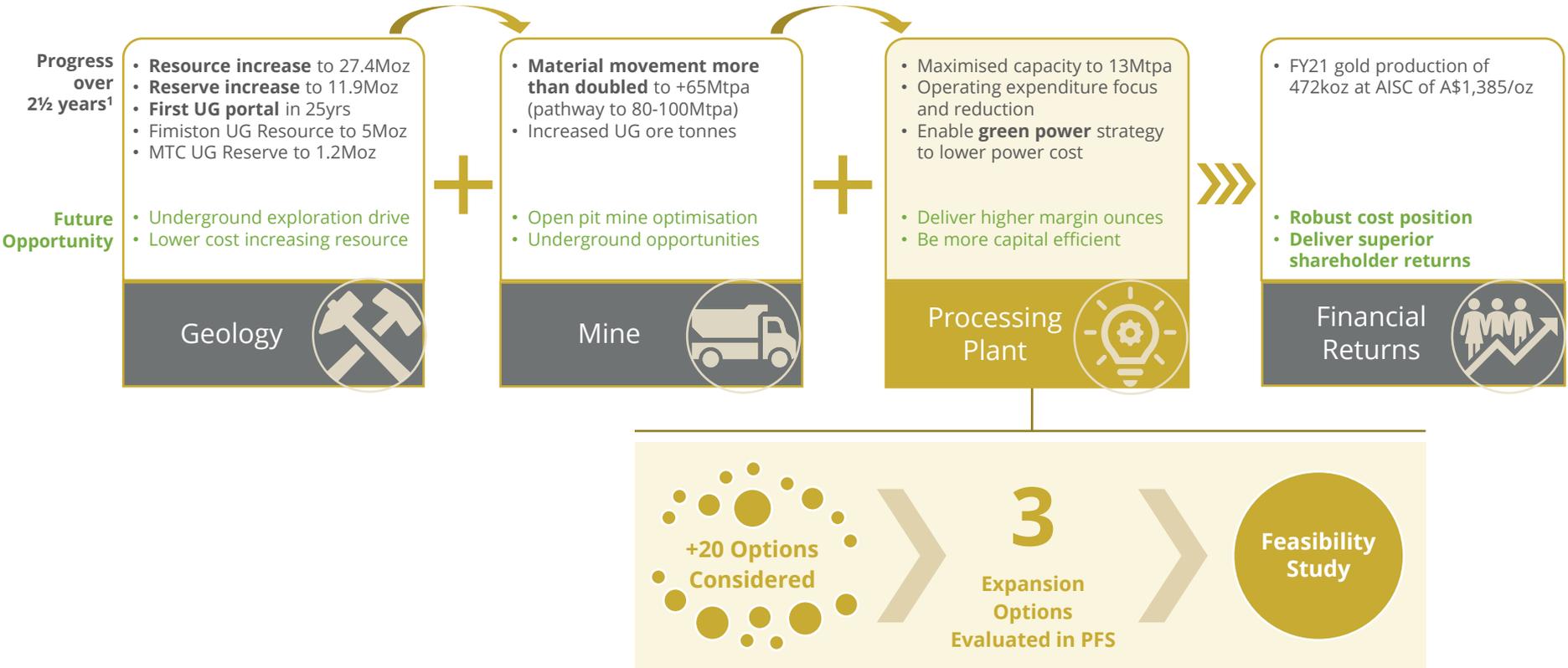
PROCESSING -  
Our continuous improvement journey

# Current process flowsheet

- Continuing to invest and optimise in asset maintenance and productivity and reliability improvement

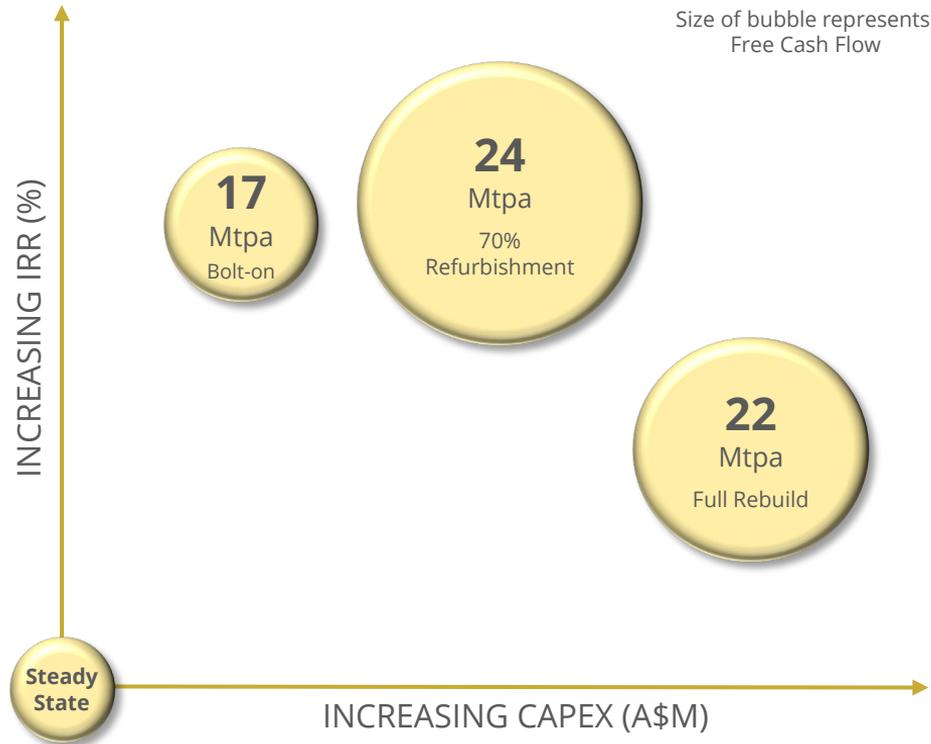


# KCGM Optionality: Mill Optimisation Study



<sup>1</sup> Northern Star acquired 50% of KCGM on 3 January 2020, and acquired 100% control of KCGM as a result of the merger with Saracen Mineral Holdings Ltd implemented on 12 February 2021.

# KCGM Optionality: Three expansion options being considered



## Stage: Pre-Feasibility Study

All three mill expansion options are **financially compelling**<sup>1</sup> (post tax)

- At gold price of A\$2,250/oz:
  - IRR: 13–26%
  - Payback: 3-5 years
- At spot price of A\$2,600/oz:
  - IRR: 16-31%
  - Payback: 2-5 years
- Capex: A\$440M – A\$1,400M
- Substantial increase in NPV

<sup>1</sup> Potential mine optimisation not included in presented metrics; Life of Mine metrics assume tonnage remains constant.

# KCGM Optionality: Three expansion options being considered

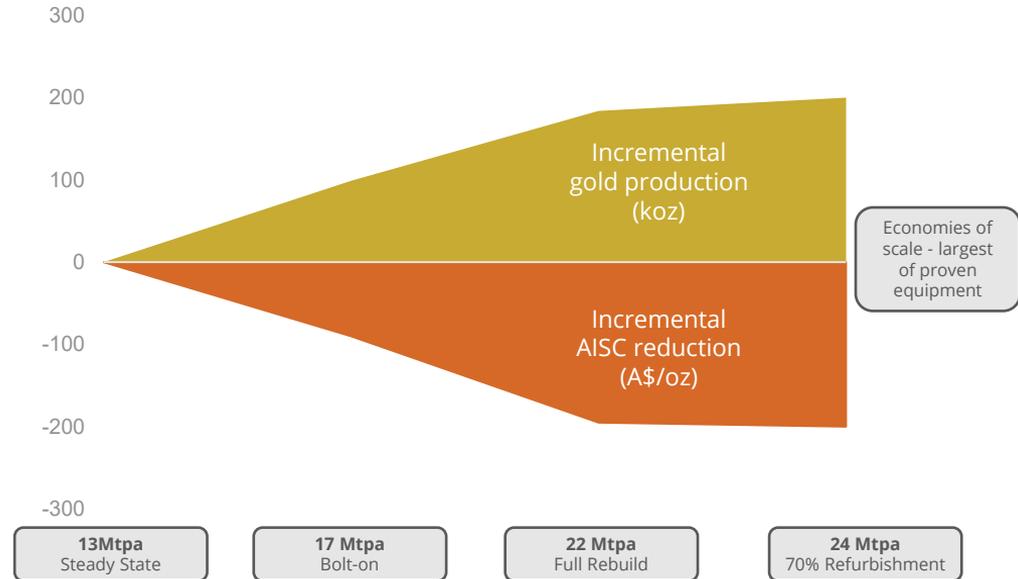
All three expansion options<sup>1</sup> deliver **meaningful operational benefits:**

- Gold production growth of 100–200kozpa<sup>2</sup>
- KCGM AISC reduction up to A\$200/oz<sup>2</sup>
- Renewables deliver emissions and costs reduction

Further opportunities provided by:

- Open pit mine optimisation
- Underground mining growth
- Leverage UG resources vs stockpiles
- Regional opportunities as a result of lower cost base
- Resource conversion growth
- Scheduling and project execution planning

Incremental Gold Production vs AISC



<sup>1</sup> Permitting is required for all expansion options. 22Mtpa option requires new plant location on the existing tenure footprint.

<sup>2</sup> Average over first 10 years post-construction.



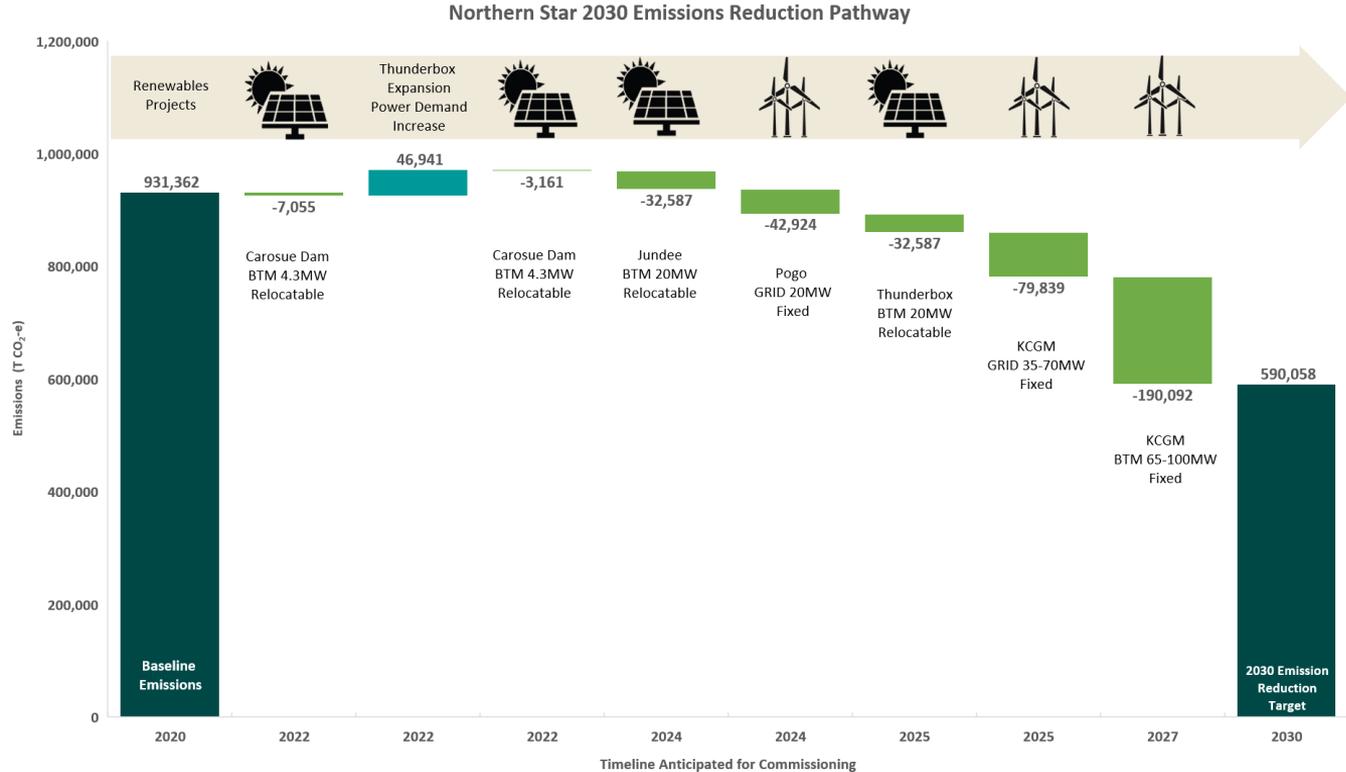
RENEWABLE POWER -  
Our continuous improvement journey

# 2030 Pathway to Reduce Emissions by 35%

Strategic value

**Goldfields Power**  
(Parkeston, Kalgoorlie)

**KCGM**  
Up to **60%**  
renewable power





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IN CONCLUSION



# KCGM: The most prominent gold address in Australia



- KCGM revitalising a world-class asset
- 65Moz mined to date and just starting
- Average depth of the pit 500m, UG story commencing with drill platform and resource growth along with pit development
- Processing improving the current systems and processes along with regional processing opportunities and potential Mill expansion to consider
- 9km of highlight prospective corridor to unlock for open pit and UG mining methods
- Only 18 months of ownership under 1 Australian company who are nimble, focused on returns and the long term

# Northern Star Resources Limited

ASX Code: NST



## Business First.



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