



Northern Star Resources Limited  
ASX: NST  
ABN: 43 092 832 892



Saracen Minerals Holdings Limited  
ASX: SAR  
ABN: 52 009 215 347

Kalgoorlie Consolidated Gold Mines Pty Ltd (ABN: 97 009 377 619) is the Manager of the KCGM Operations for the 50:50 Joint Venture partners.

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## KCGM Site Visit Presentation

Diggers & Dealers  
October 2020



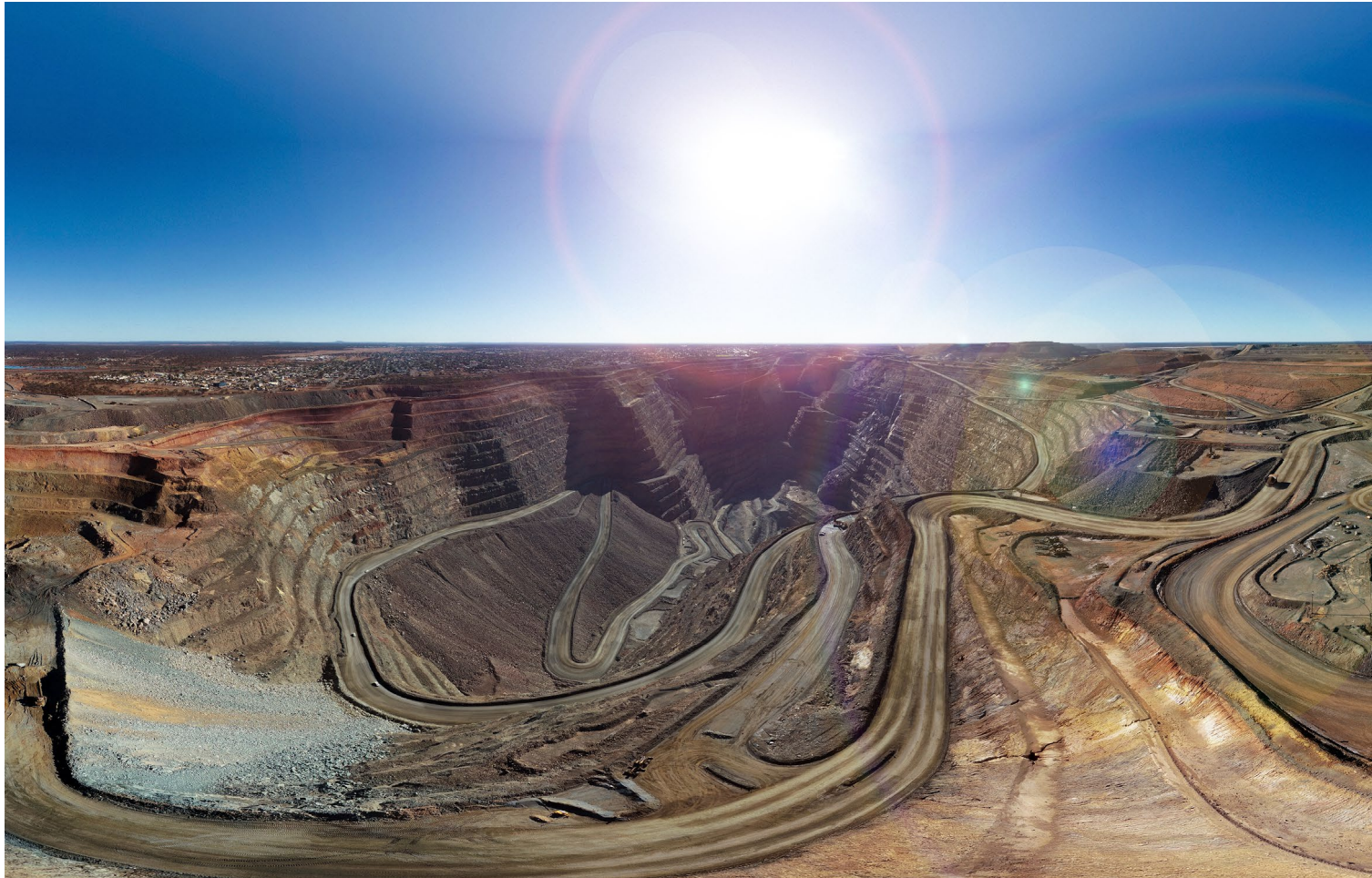
This announcement contains estimates of Kalgoorlie Consolidated Gold Mines Pty Ltd's (KCGM) ore reserves and mineral resources and also production targets that are a product of these estimates. Northern Star and Saracen are participants in the 50:50 incorporated joint venture that owns the assets and operations of KCGM (including the Super Pit). The information in this joint announcement that relates to the ore reserves and mineral resources, and production targets of KCGM has been extracted from Northern Star's and Saracen's joint ASX announcement entitled "KCGM Reserves, Resources and Guidance Update" dated 18 August 2020, available at [www.nsr ltd.com](http://www.nsr ltd.com) and [www.asx.com](http://www.asx.com) (**KCGM Announcement**),

Both Northern Star and Saracen confirm that they are not aware of any new information or data that materially affects the information included in the KCGM Announcement and, in relation to the estimates of KCGM's ore reserves and mineral resources, that all material assumptions and technical parameters underpinning the estimates in the KCGM Announcement continue to apply and have not materially changed. Northern Star and Saracen confirm that the form and context in which the Competent Person's findings are presented have not been materially modified from that announcement.

## **Forward Looking Statements**

Northern Star Resources Limited and Saracen Mineral Holdings Limited have jointly prepared this announcement based on information available to them. No representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information, opinions and conclusions contained in this announcement. To the maximum extent permitted by law, none of Northern Star Resources Limited or Saracen Mineral Holdings Limited, their directors, employees or agents, advisers, nor any other person accepts any liability, including, without limitation, any liability arising from fault or negligence on the part of any of them or any other person, for any loss arising from the use of this announcement or its contents or otherwise arising in connection with it.

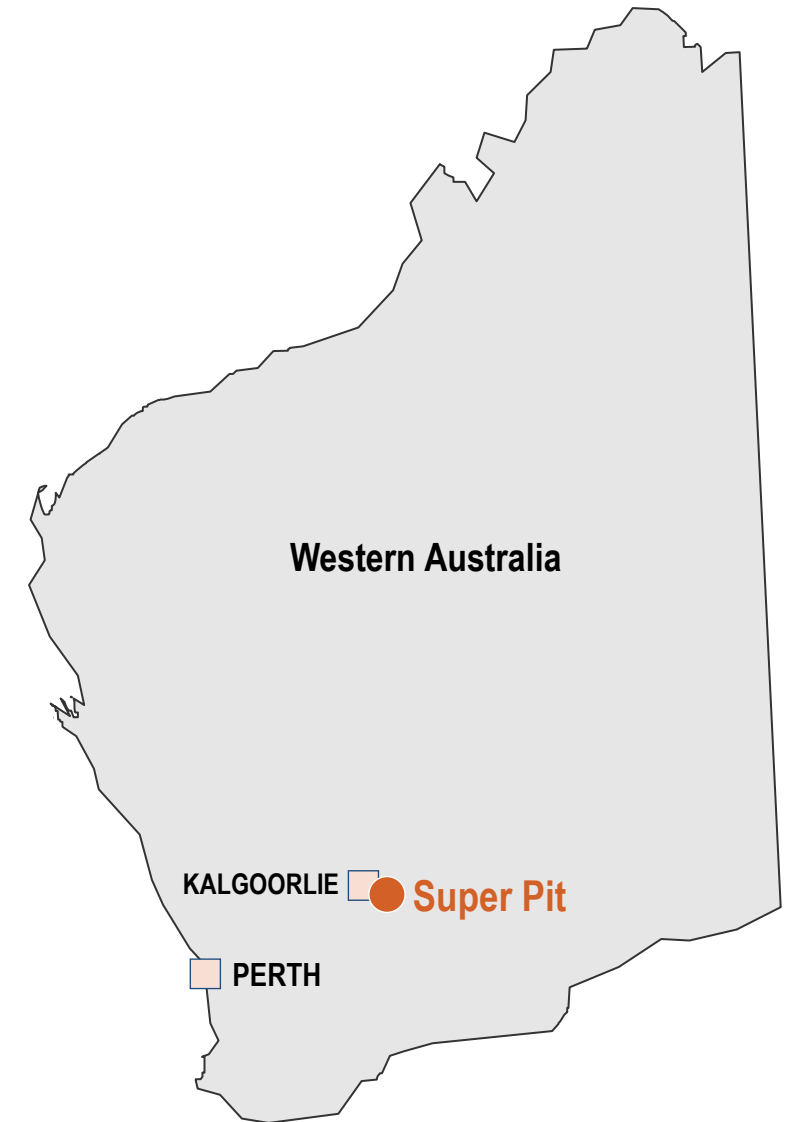
This announcement is not an offer, invitation, solicitation or other recommendation with respect to the subscription for, purchase or sale of any security, and neither this announcement nor anything in it shall form the basis of any contract or commitment whatsoever. This announcement may contain forward looking statements that are subject to risk factors associated with gold exploration, mining and production businesses. It is believed that the expectations reflected in these statements are reasonable but they may be affected by a variety of variables and changes in underlying assumptions which could cause actual results or trends to differ materially, including but not limited to price fluctuations, actual demand, currency fluctuations, drilling and production results, reserve estimations, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory changes, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.



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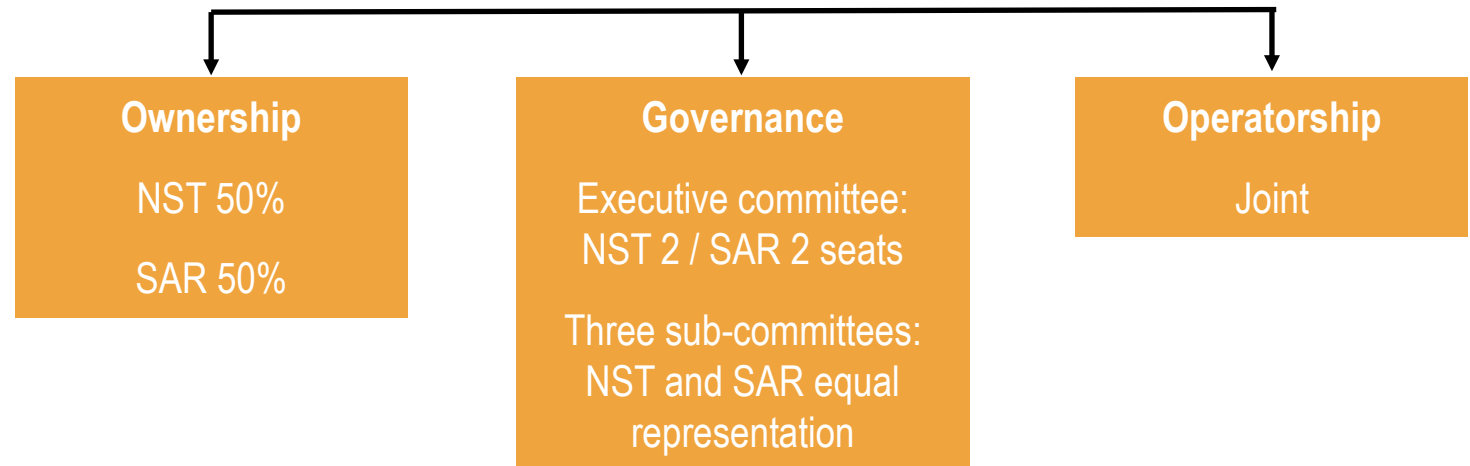
- Tier-1 asset in a Tier-1 mining jurisdiction, previously “hidden” in global major miners... enter Saracen and Northern Star
- Landmark increase in Reserves to 9.7Moz (100%) supporting 15 year mine life
- FY21 guidance 440 - 480koz at AISC of A\$1,470 - 1,570/oz (100% basis)
- Operation being de-risked and productivities are increasing with multiple production sources
- Production to rise to +675koz pa (100%) by FY28
- Pipeline of further growth opportunities underpinned by a size increase in Resources to 19.0Moz (100%)...
- ...and exploration upside from 84Moz gold camp



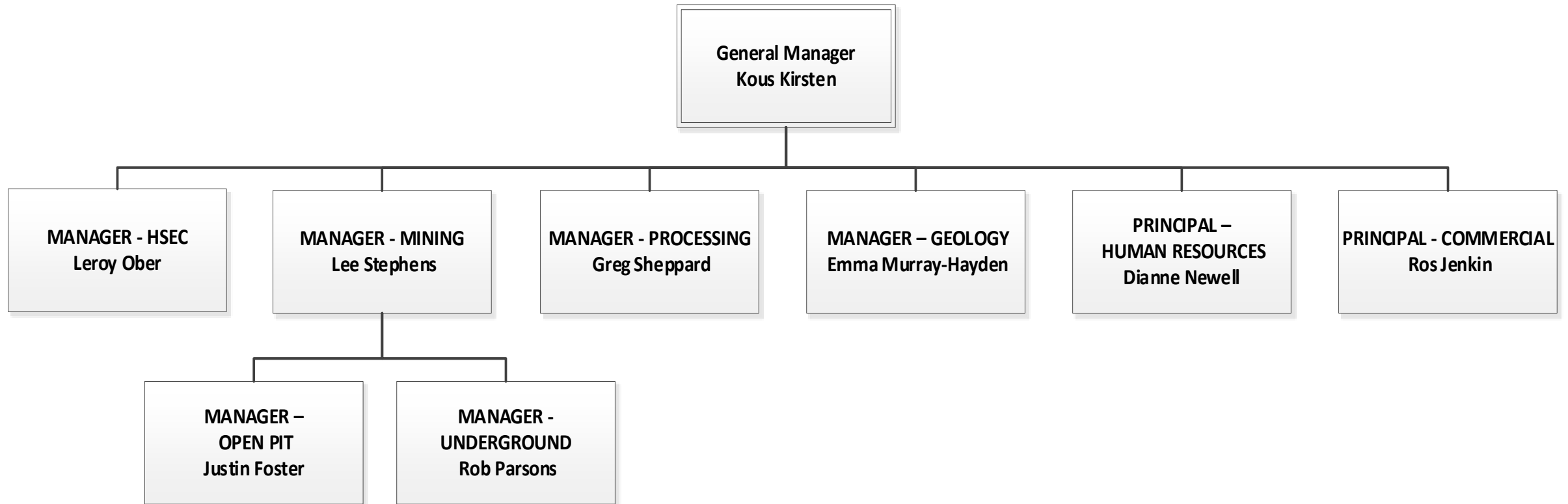
- Likeminded JV partners...
- ...with complementary skills...
- ...to unlock latent value
- 6<sup>th</sup> October 2020 - NST and SAR announce proposed merger-of-equals, unlocking A\$1.5-2.0B in synergies (group wide)
- Strategic merger will consolidate the Kalgoorlie “Golden Mile” under one owner for the first time in its +125 year history



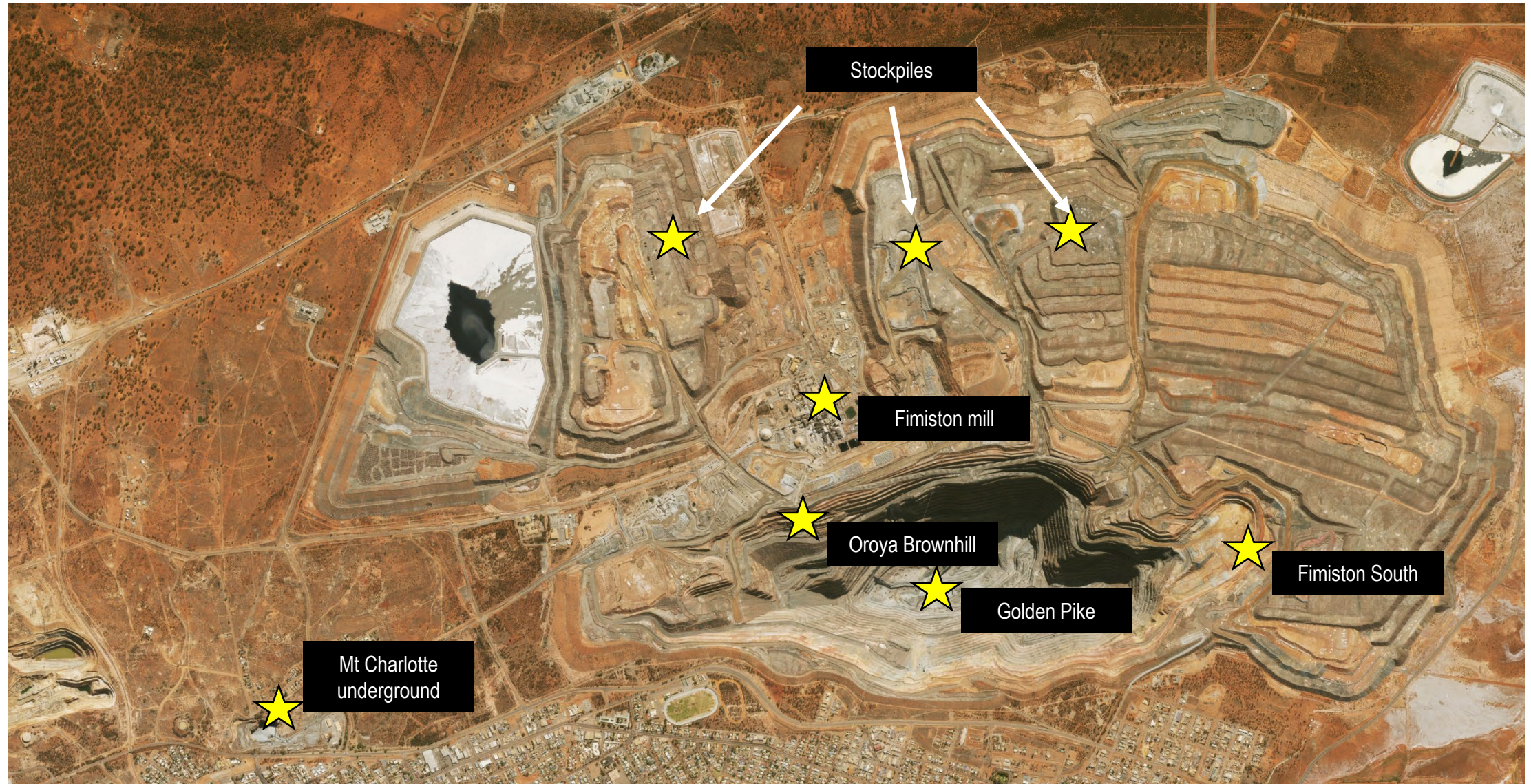
**JV between Northern Star (ASX: NST) and Saracen (ASX: SAR)**



## Site Leadership Team:



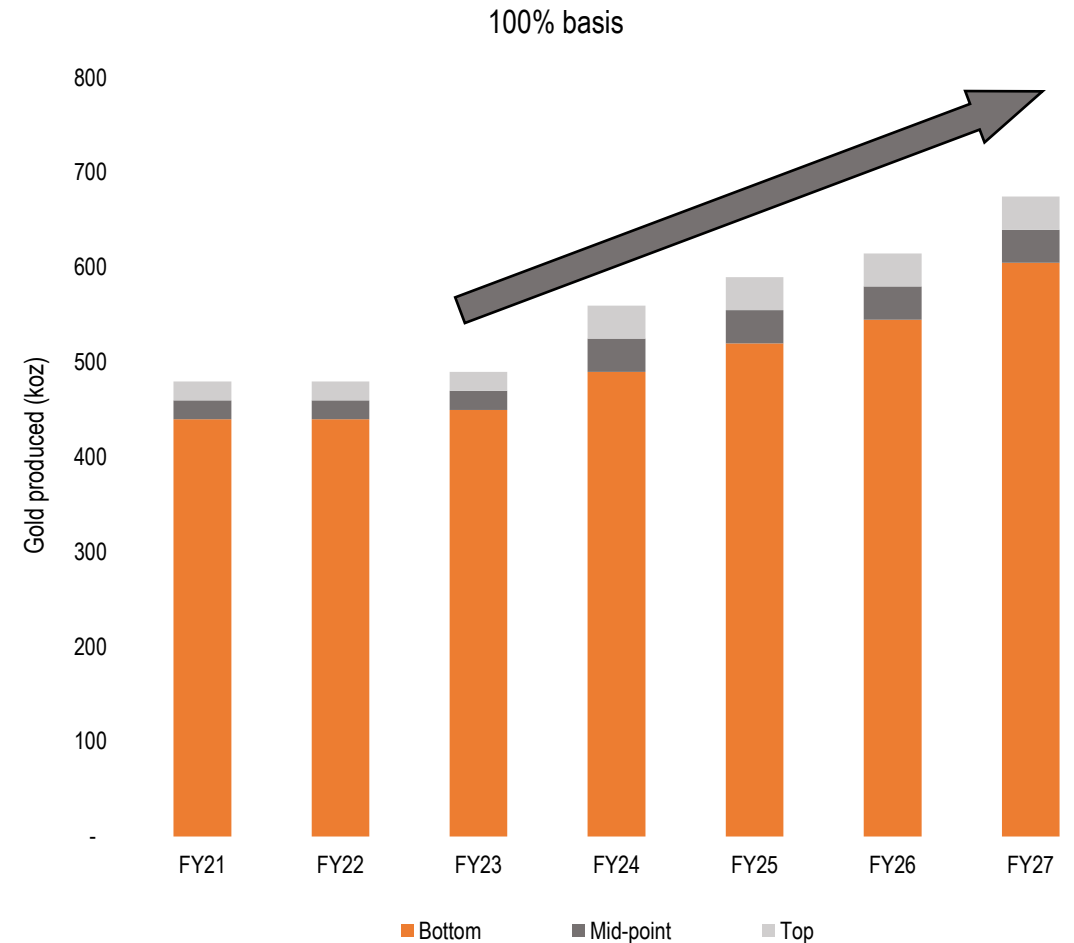






## Robust plan to deliver profitable production growth:

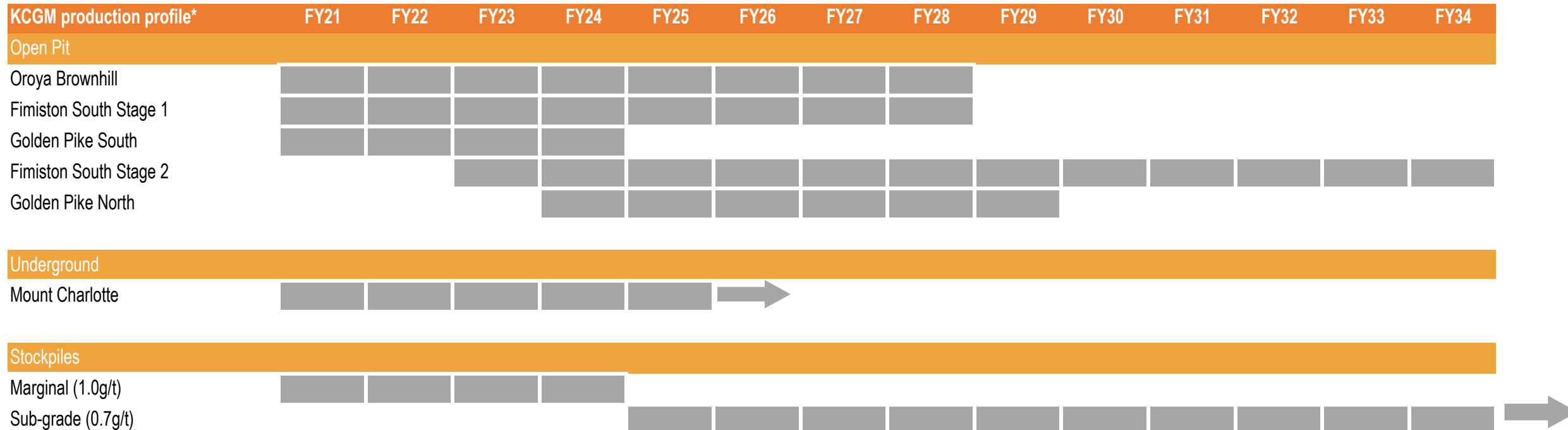
- Production to rise to +675,000ozpa by FY28, key drivers:
  - Focus on large, low cost mining areas that maximise fleet productivity
  - East wall remediation, integrated with the expedited Oroya Brownhill (OBH, additional ounces offset remediation cost)
  - Fimiston South ramp-up (baseload supply, maiden Reserve 3.9Moz)
  - Increased access to Golden Pike North (high grade, low strip ratio)
  - Displacing lower grade stockpile feed
- Excludes Fimiston Underground (Maiden Resource 2.2Moz), A\$10m allocated in FY21 to support exploration activities





## Long life:

- **9.7Moz Reserve provides 15 year mine life visibility**



\* Based on Reserves at 30 June 2020

## Growth capital outlook:

- **FY21 growth capital guidance A\$210m (100%)**

Item	A\$m
<b>KCGM</b>	
Open pit development - Oroya Brownhill	96
Open pit development - Fimiston South	68
Underground portal	10
Capital works	24
Resource evaluation	12
<b>Total</b>	<b>210</b>

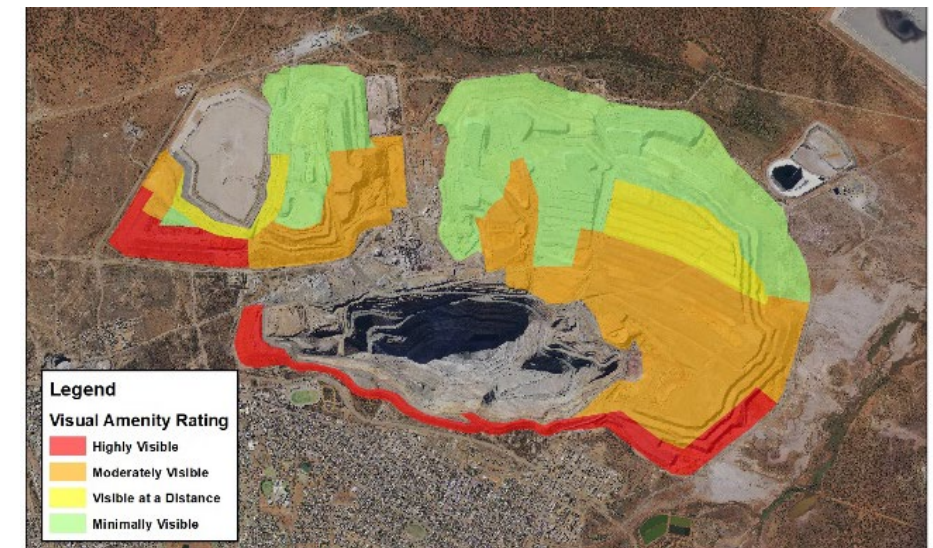
- FY22 growth and de-risking capital guidance of A\$240-270m (100%)

## Environmental Impact Management

- Dust, Noise, Vibration and well understood and managed to minimise impacts
- Live monitoring data sites provide real time data for decision making and agile response
- Live data publically available
- Key environment plans are approved by regulators

## Mine Closure

- Progressive rehabilitation program developed and implemented
- Mine closure integrated in business planning
- Visual Amenity concept approved and implemented
- 2018 Mine Closure Plan approved





## Protect and Grow our Social Licence

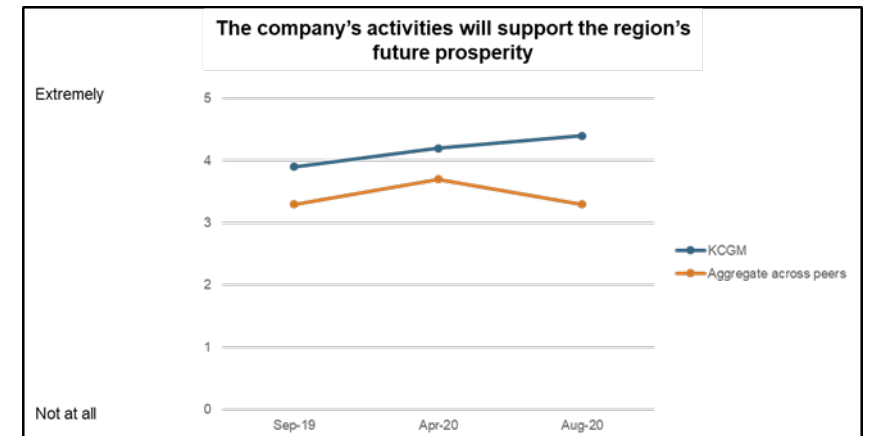
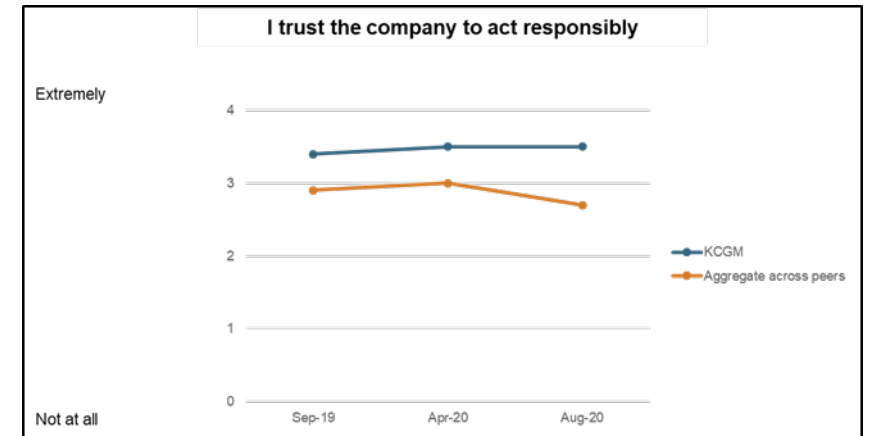
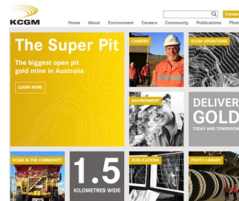


- Sophisticated engagement tool that enables KCGM to track & trend community perception over time
- Data publically available
- Enables an agile response to emerging community issues & opportunities
- Increased trust in KCGM
- Out perform industry peers in key trust metrics (10 Aus. mining operations – aggregated)
- Developed by CSIRO

## Public information and interaction tools

  
~30,000  
Population of  
Kalgoorlie-Boulder

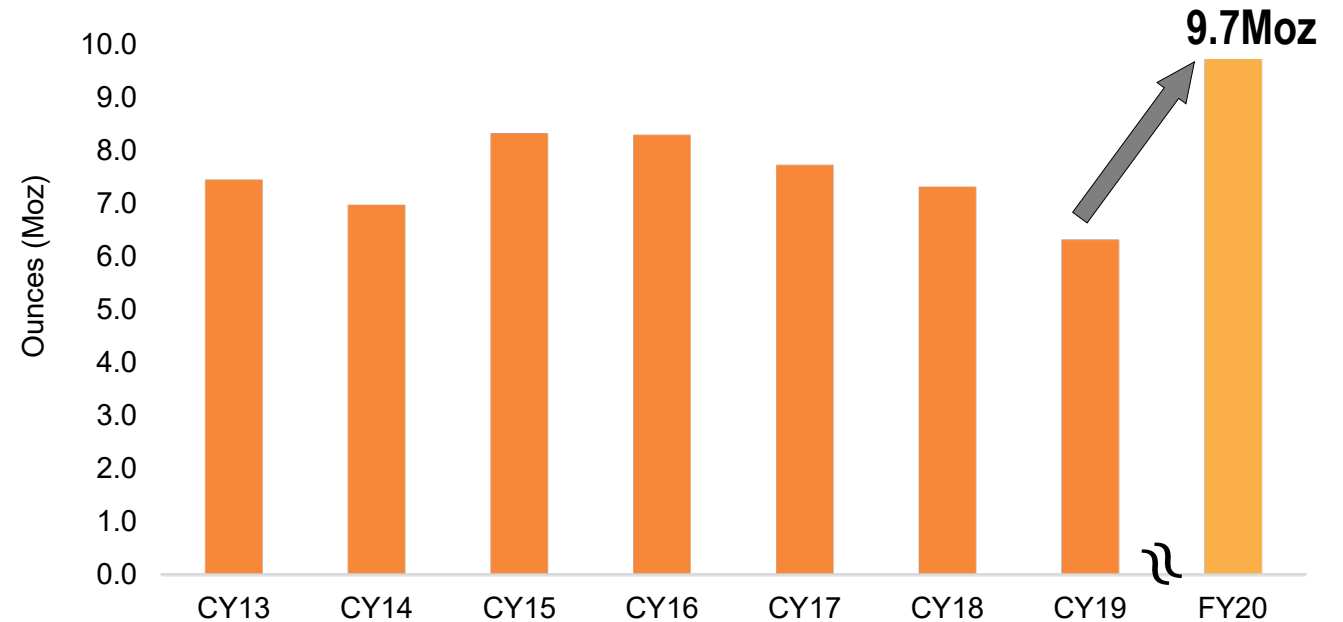
  
~24 hour  
Public Interaction  
Hotline



The relationship between KCGM and the community of Kalgoorlie-Boulder is **strong**, and **has improved** since the change in ownership

## 9.7Moz JORC-compliant Ore Reserves (v 6.3Moz previous non-JORC):

- Investment in drilling unlocks strong increase in Ore Reserves
- Substantial program at Fimiston South the key driver to Ore Reserve increase
- Global leading endowment continues to respond well to drilling investment
- Outstanding drill results\* outside current Ore Reserve in open pitable positions point to further upside at Fimiston South



KCGM annual ore reserves since 2013;  
CY13-CY19 are non-JORC compliant estimates; FY20 are JORC compliant Ore Reserves

### KCGM ORE RESERVES as at 30 June 2020

	PROVED			PROBABLE			TOTAL RESERVES		
	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)
100% KCGM									
<b>FIMISTON</b>	130,000	0.7	3,100	100,000	1.8	6,100	230,000	1.2	9,200
<b>MT CHARLOTTE</b>	290	2.4	23	7,200	2.1	490	7,500	2.1	510
<b>KCGM TOTAL</b>	<b>130,000</b>	<b>0.7</b>	<b>3,100</b>	<b>110,000</b>	<b>1.8</b>	<b>6,600</b>	<b>240,000</b>	<b>1.3</b>	<b>9,700</b>

**Note:**

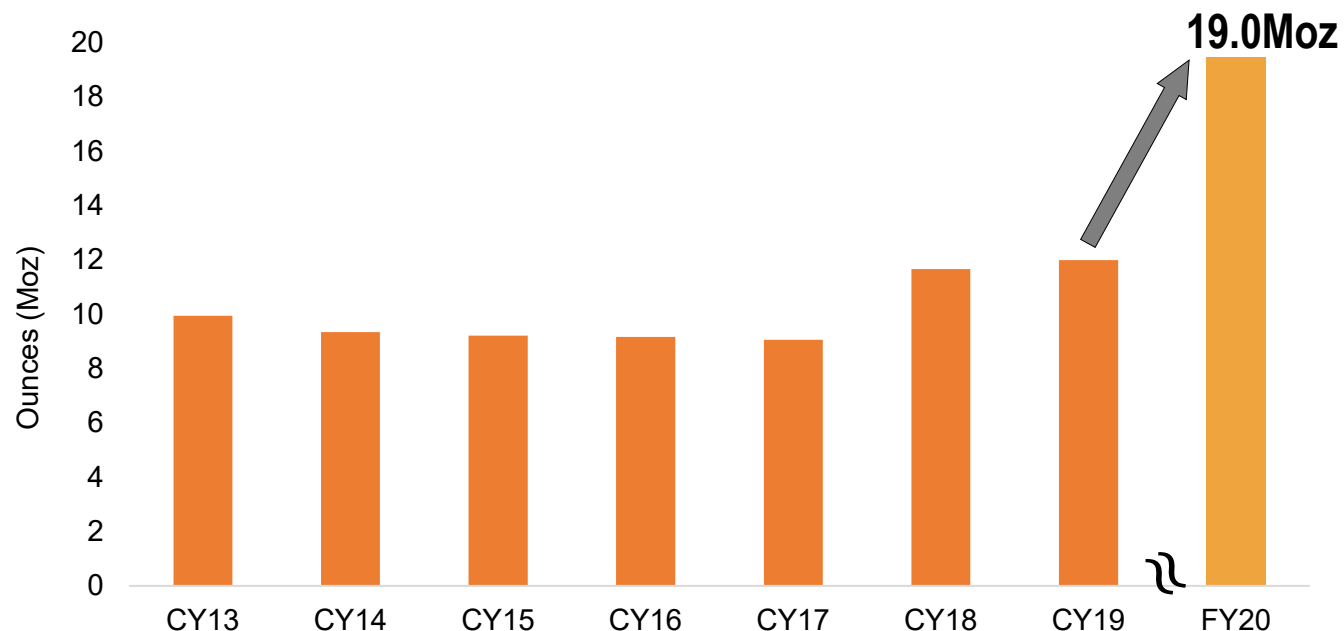
1. Ore Reserves are reported at A\$1,750/oz Au
2. Rounding may result in apparent summation differences between tonnes, grade and contained metal content.

**Competent Persons:**

1. Fimiston; Ibrahim Omari
2. Mt Charlotte; Jeff Brown

## 19Moz JORC-compliant Mineral Resources (v 12Moz previous non-JORC):

- Significant growth at Fimiston South through an extensive drill program
- Maiden Fimiston underground JORC compliant Mineral Resource of 2.2Moz highlights ongoing growth opportunity
- Size increase in Mineral Resource at Mt Charlotte underground
- Future Mineral Resource growth potential across a number of mature and early stage projects



KCGM annual mineral resources since 2013;  
CY13-CY19 are non-JORC compliant estimates; FY20 are JORC compliant Mineral Resources

KCGM MINERAL RESOURCES as at 30 June 2020												
100% INCLUSIVE OF RESERVE	MEASURED			INDICATED			INFERRED			TOTAL RESOURCES		
	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)
<b>FIMISTON</b>	130,000	0.7	3,100	160,000	1.9	9,700	67,000	2.1	4,500	350,000	1.5	17,000
<b>MT CHARLOTTE</b>	-	-	-	21,000	2.0	1,300	7,200	2.4	550	28,000	2.1	1,900
<b>KCGM TOTAL</b>	<b>130,000</b>	<b>0.7</b>	<b>3,100</b>	<b>180,000</b>	<b>1.9</b>	<b>11,000</b>	<b>74,000</b>	<b>2.1</b>	<b>5,000</b>	<b>380,000</b>	<b>1.6</b>	<b>19,000</b>





**Note:**

1. Mineral Resources are inclusive of Ore Reserves.
2. Mineral Resources are reported at A\$2,250/oz Au
3. Rounding may result in apparent summation differences between tonnes, grade and contained metal content.

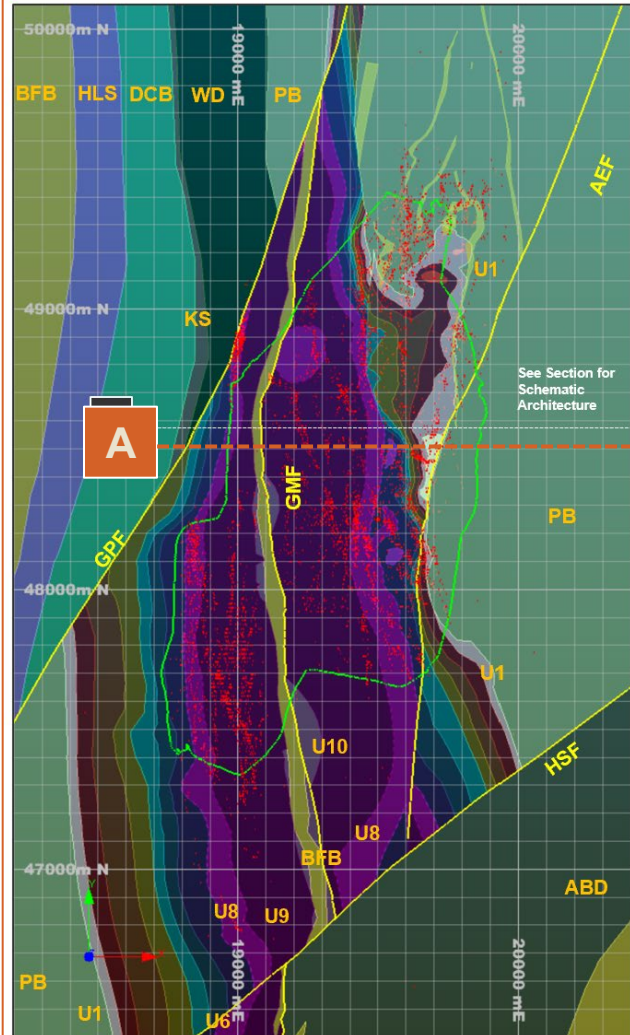
**Competent Persons:**

1. Emma Murray-Hayden

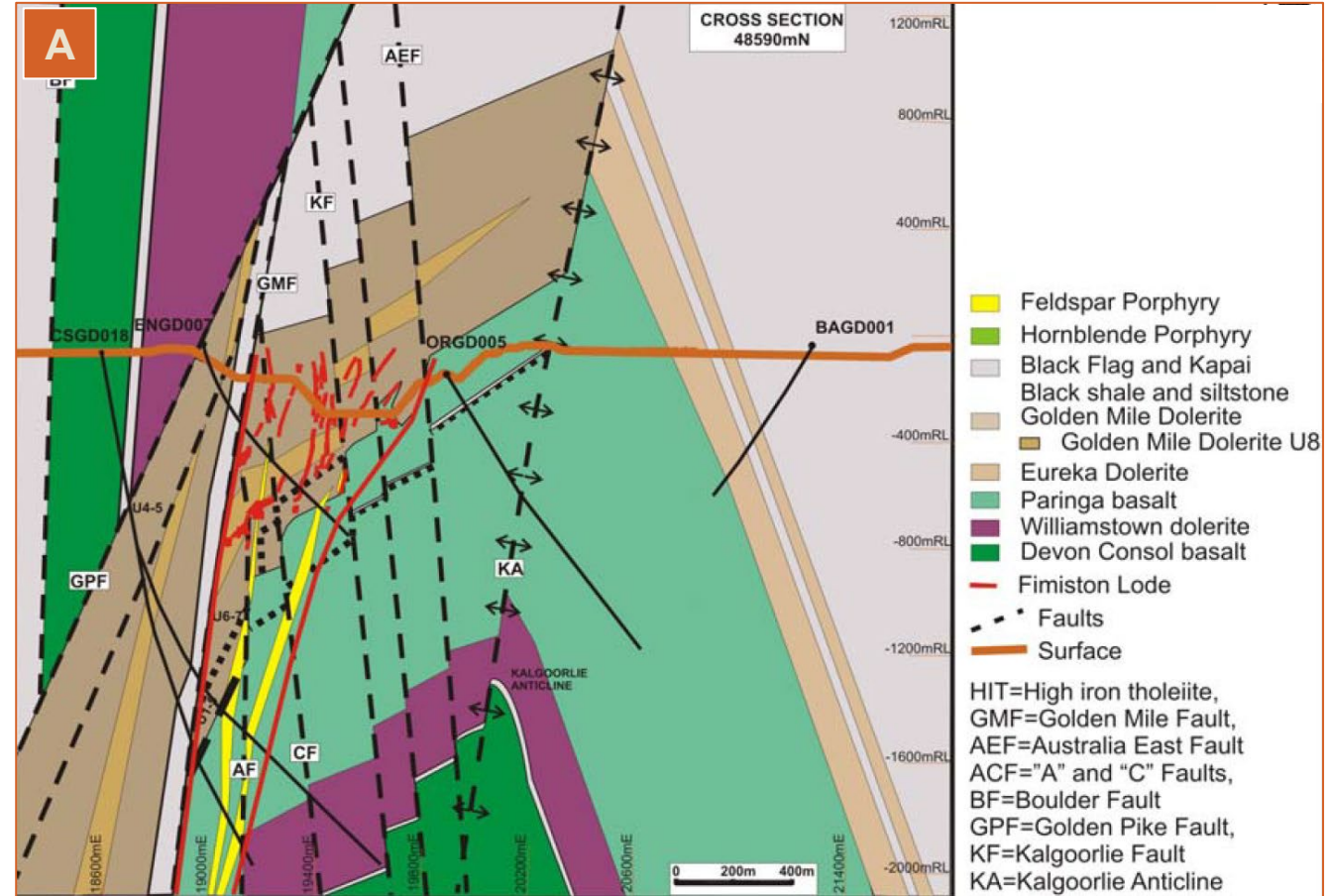
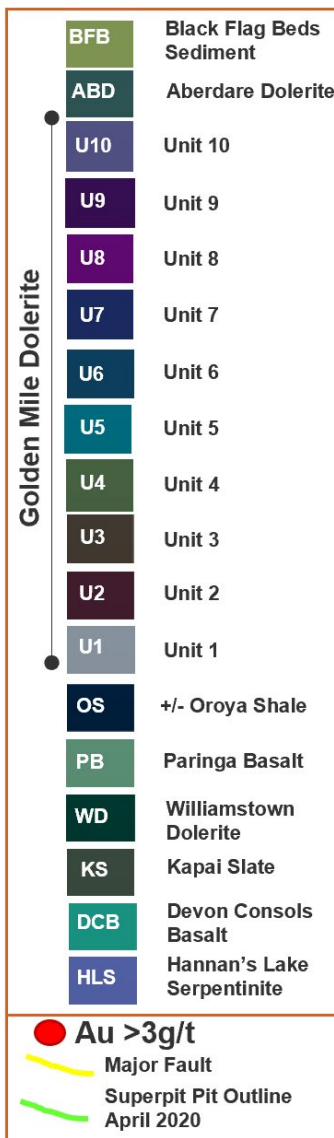


	FIMISTON STYLE DEPOSITS	CHARLOTTE STYLE DEPOSITS
<b>HISTORIC PRODUCTION</b>	414.2Mt @ 5.0g/t Mined (62Moz Produced) between 1893-Oct 2019	48.2Mt @ 3.7g/t Mined (5.5Moz Produced) between 1963-Oct 2019
<b>DEPOSIT TYPE</b>	Archaean Orogenic structurally-controlled deposit	Archaean Orogenic structurally-controlled deposit
<b>HOST ROCKS</b>	<b>Various:</b> Predominantly in a Layered differentiated mafic sill (Golden Mile Dolerite), with mineralisation also present in tholeiitic to high-Mg Basalts, ultramafics and sediments. Gold in the greater Golden Mile can be found in <b>ALL</b> lithotypes	Predominantly in the granophyric zone (Unit 8) of a layered differentiated mafic sill (Golden Mile Dolerite). Lesser occurrences are located in other rock types adjacent to D4 structures (e.g., basalt)
<b>MINERALISATION</b>	<p>Ductile to brittle shear-hosted silica-sericite-sulphide-telluride-gold lodes that are expressed as qtz-cb veinlets, breccias, banded chalcedonic veinlets or stringers.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p><i>Fimiston Lode in Paringa Basalt (36g/t Sample) Source: O'Donohue 2009</i></p> </div> <div style="text-align: center;">  <p><i>Chaffers Main Lode in U9 GMD (31g/t Sample) Source: O'Donohue 2009</i></p> </div> </div> <p>4 main orientations: Main (350°-010° strike), Caunter (315°-350° strike), Cross Lodes (085°-135° Strike), Oblique (010°-030° Strike)</p>	<p>Brittle mm to m scale quartz vein stockworks and/or stringers, surrounded by pyrite-pyrrhotite rich alteration halo</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p><b>LEGEND</b>            ■ INNER HALO (Bleached)            ■ OUTER HALO (Semi-Bleached)            □ Weakly Bleached to Unbleached            — Fault            — Quartz Vein            — Alteration Boundary</p> <p>0 1 2m</p> </div> <div style="text-align: center;">  <p><i>Source: Nixon 2014</i></p> </div> </div> <p>2 main vein sets: <b>1)</b> Strike 080° – 100°, dip 50° to 80° north <b>2)</b> Strike 090° – 120°, dip 0°-45° north</p>
<b>ORE MINERALOGY</b>	Dominant Pyrite; Lesser Telluride, tetrahedrite, tennantite, Arsenopyrite, Galena, Sphalerite	Dominant Pyrite, Pyrrhotite; Lesser Chalcopyrite, Galena, Sphalerite
<b>STRUCTURE</b>	Multi-phase structural history in an accretionary margin. <b>D1)</b> thrust stacking and folding, causing stratigraphic repetition; <b>D2)</b> Regional ENE-WSW compression thrusting & folding; <b>D3)</b> E-W Compression strike and reverse faults with enechelon folds; <b>D4)</b> E-W Compression, dextral reverse oblique faults ( <i>Source: simplified from Vielrecher et al 2016 – note that there are numerous interpretations of structural genesis</i> )	
<b>ALTERATION</b>	Dominant: Sericite - Carbonate – Albite; Lesser He-Mag-rut-tour-rosc	Combination of Sericite - Ankerite - Albite – Rutile

## Plan -250mRL (+/-25m Clipping)



GMF: Golden Mile Fault GPF: Golden Pike Fault HSF: Hannan's Star Flt AEF: Australia East Fault



Schematic cross section at 48,590mN. Source: Gauthier 2005

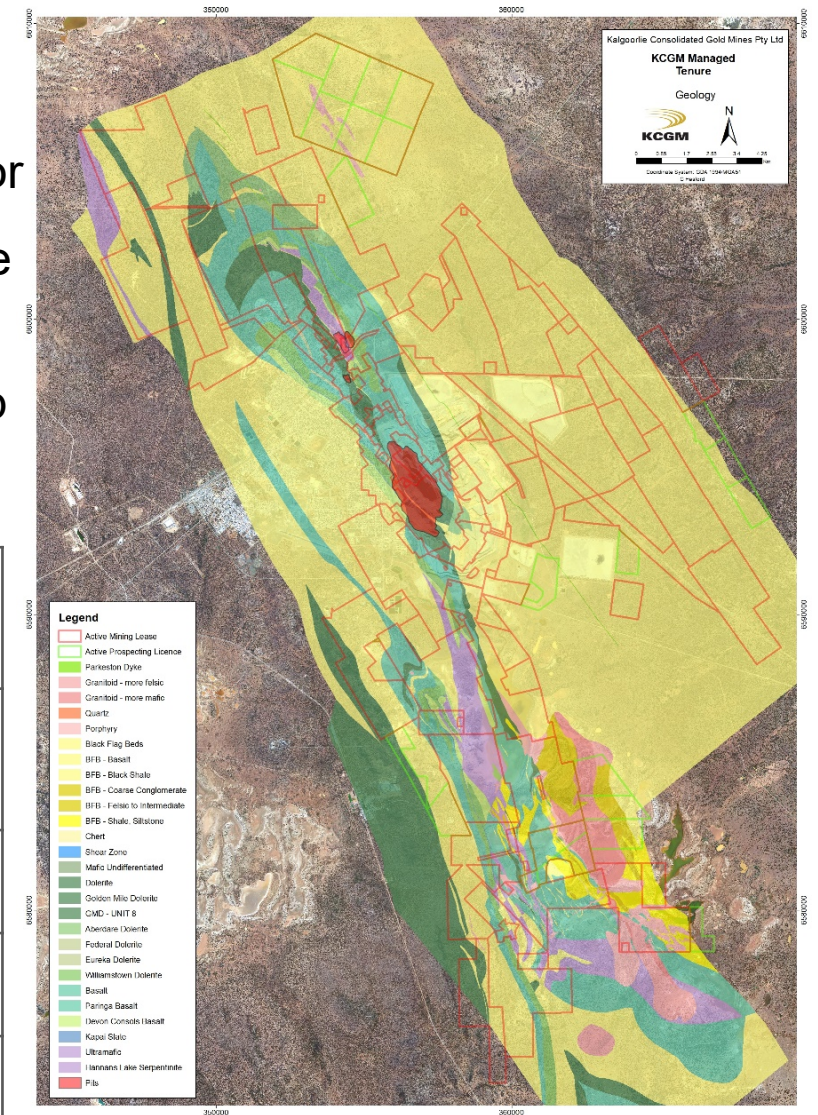
- The Golden Mile fault separates the Fimiston system into the Eastern and Western lodes



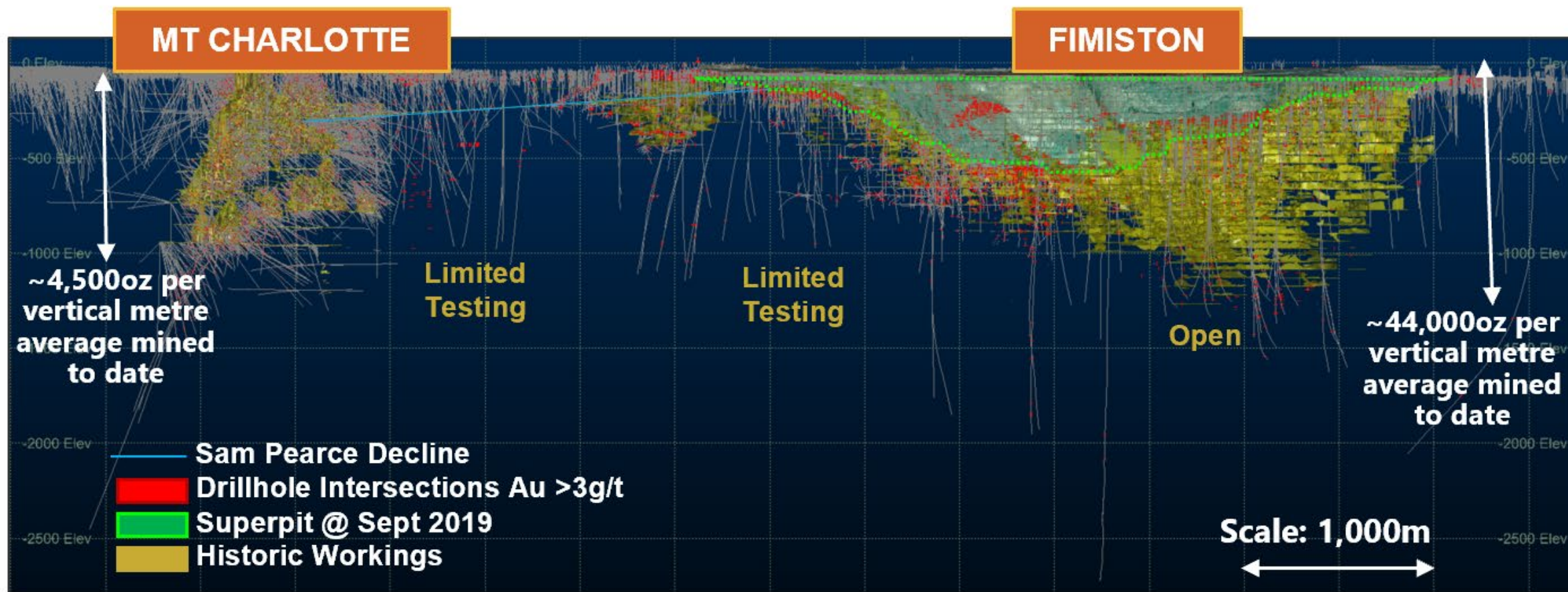
## World Class Growth Potential

- 297km<sup>2</sup> of tenure, hosting +30km of the Boulder-Lefroy structural corridor
- Limited focus on regional exploration potential on KCGM tenure over the past 20 years (opportunity)
- Strong progress made on key growth opportunities since new ownership

1	<b>FIMISTON UNDERGROUND</b>	<ul style="list-style-type: none"> <li>▪ Mineralisation not extracted by previous underground mining. This includes parallel structures, high grade pillars and fill materials around historic workings, in addition to unmined lodes beneath the historic workings</li> </ul>
2	<b>FIMISTON SOUTH</b>	<ul style="list-style-type: none"> <li>▪ Open pit and underground potential on the south-eastern part of the open pit. JORC-compliant Mineral Resource open pit now 12Moz; maiden underground Mineral Resource 2.2Moz</li> </ul>
3	<b>MT CHARLOTTE AREA</b>	<ul style="list-style-type: none"> <li>▪ Mt Charlotte area underground potential, including extensions to Mt Charlotte main orebody, Hidden Secret, Mt Ferrum and Kalgoorlie East Lodes</li> </ul>
4	<b>STOCKWORKS</b>	<ul style="list-style-type: none"> <li>▪ Charlotte-style stockwork mineralisation in Golden Mile Dolerite throughout the Golden Mile (e.g., Golden Pike Stockwork, Central Corridor, Mt Percy)</li> </ul>
5	<b>REGIONAL EXPLORATION</b>	<ul style="list-style-type: none"> <li>▪ Advancement of early to intermediate stage exploration projects, including Mt Percy, Central Corridor and Hannan's South etc.</li> </ul>



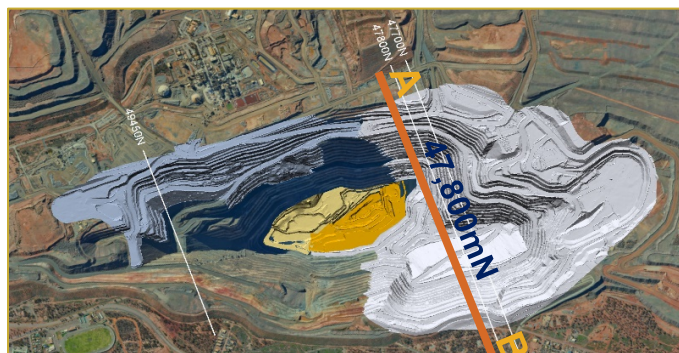




- Mature world class system, however, drill data is surprisingly sparse at depth

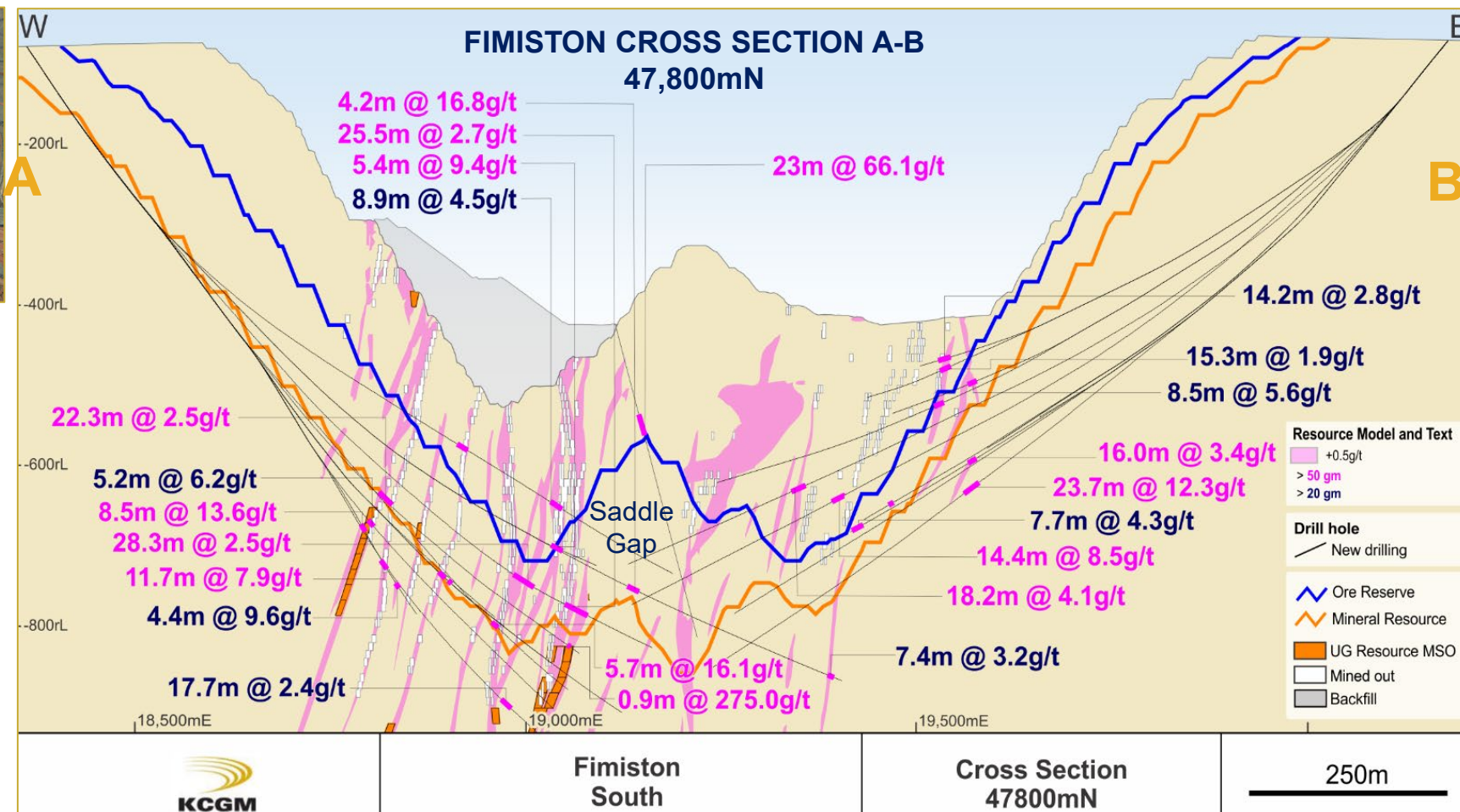


Historical drilling and drilling completed since NST/SAR ownership demonstrates significant upside potential both within and outside of the current Resource optimisation



ABOVE: Plan view of Fimiston cutback stages with the location of the 47,800mN cross section shown

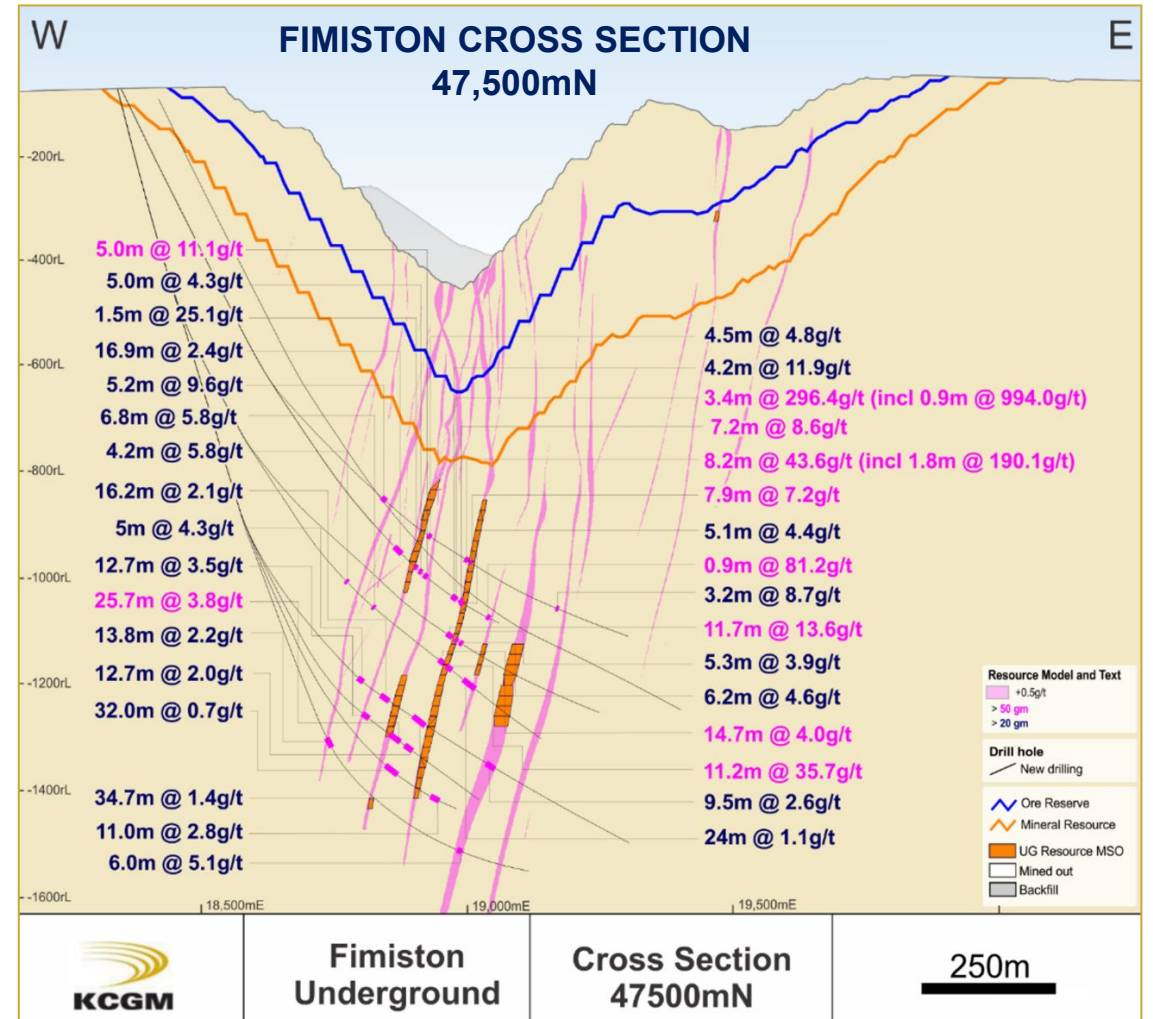
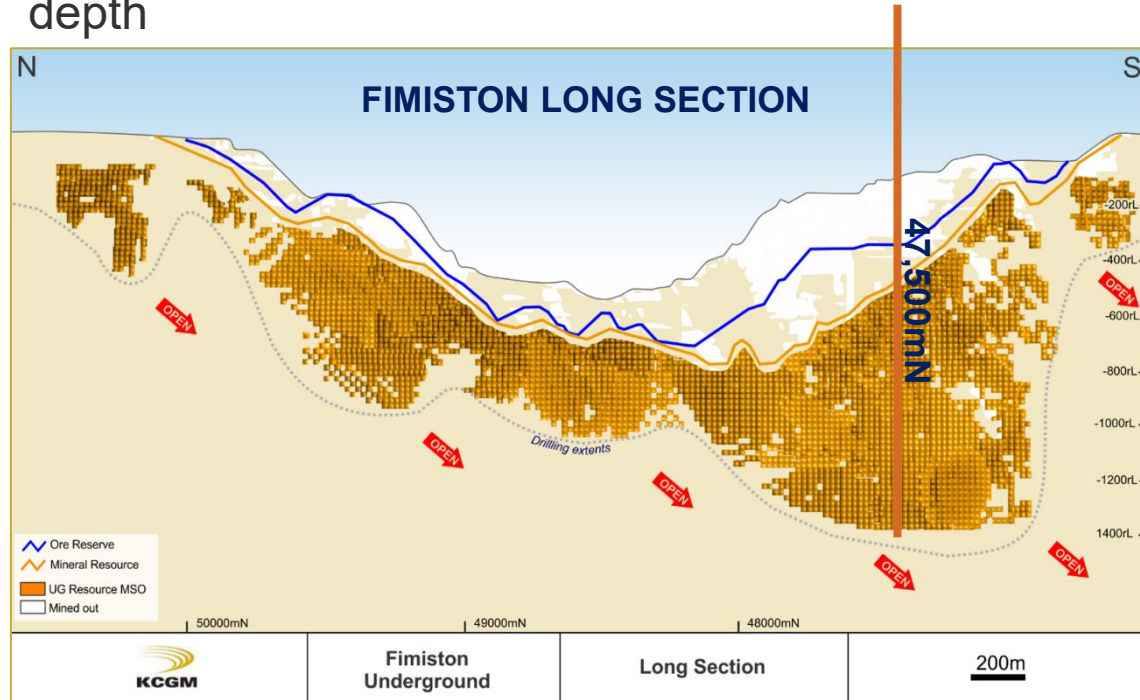
- Recent infill drilling\* completed at Fimiston has identified additional lode material both within and proximal to the Ore Reserve design (A\$1,750) and Resource optimisation (A\$2,250)
- The highlight was 23.8m @ 66.1g/t (down hole width) intersection at the top of the pit design 'saddle'. This result was received after completion of the MY20 Resource estimate. The saddle occupies an area of low drill density caused by a lack of in-pit collar positions available.



47,800mN E-W cross section through the Fimiston deposit, with select intersections shown. Note that intersection widths shown are down hole lengths.

\*Refer to ASX: NST and SAR joint announcement: 18<sup>th</sup> August 2020 "KCGM Reserves, Resources and Guidance Update"

Deep drilling beneath the June 2020 open pit Resource demonstrates the continuity of Fimiston mineralisation at depth

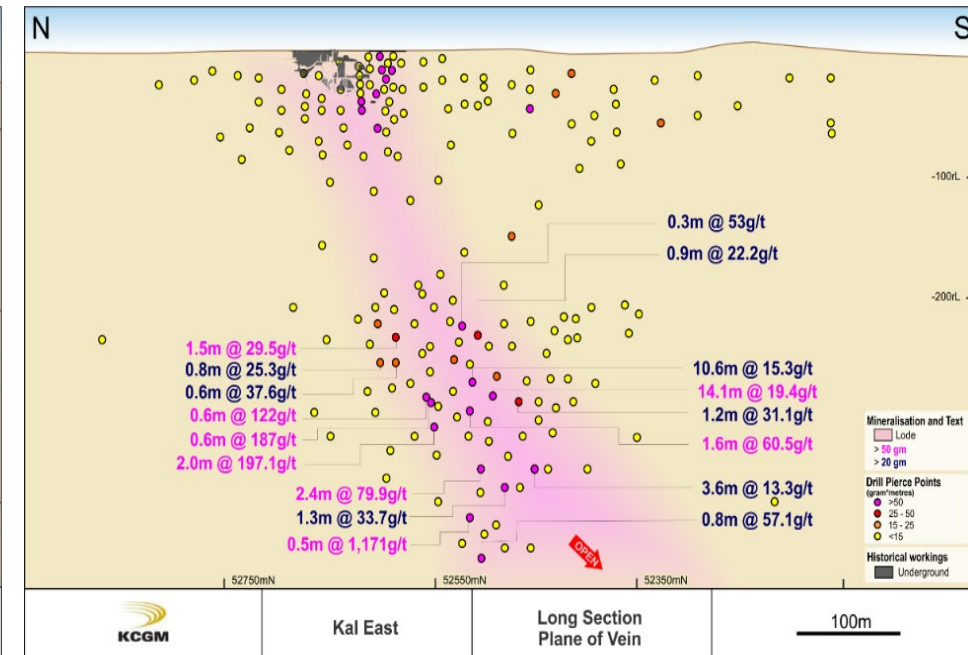
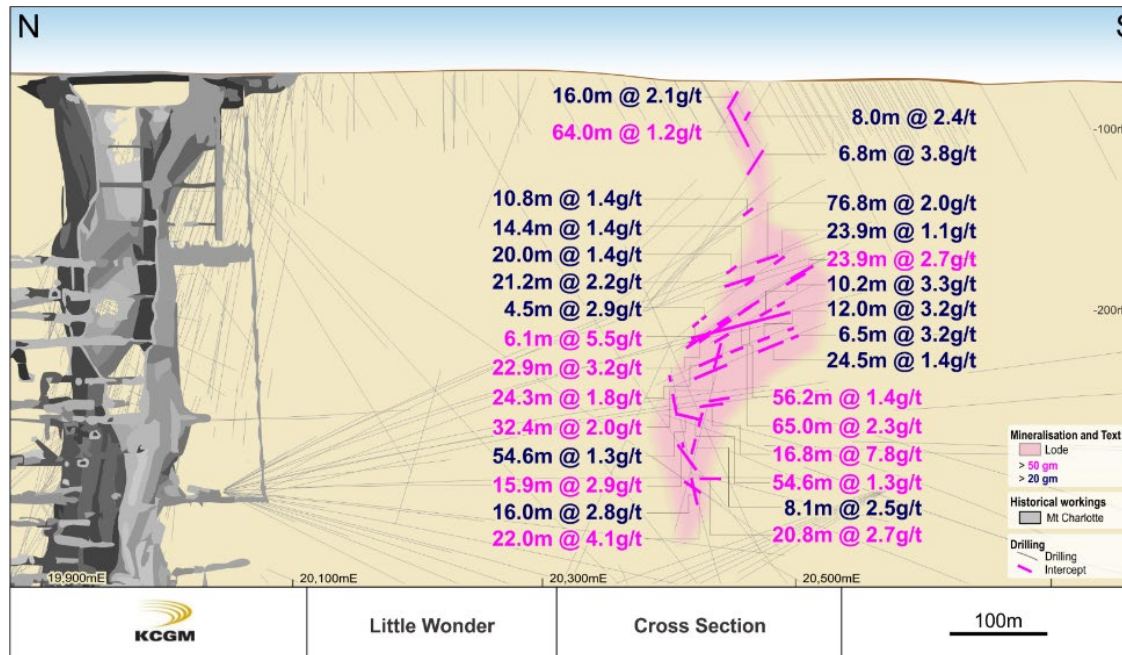
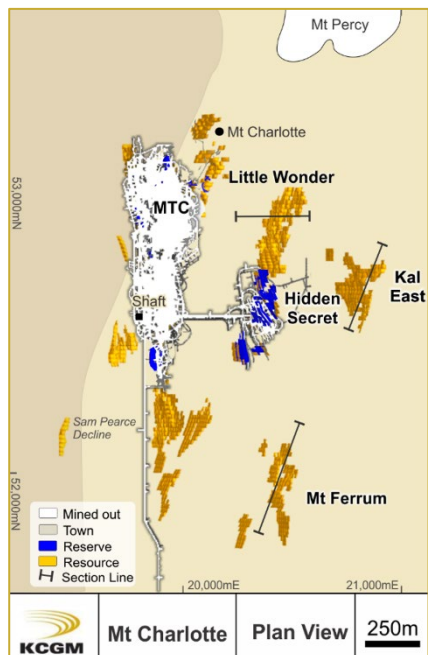


**ABOVE:** Long projection of the Fimiston deposit showing extent of drill testing. **RIGHT:** E-W Cross Section through the Fimiston Deposit at 47,500mN with select intersections shown. Note: Intersection width are down hole lengths.

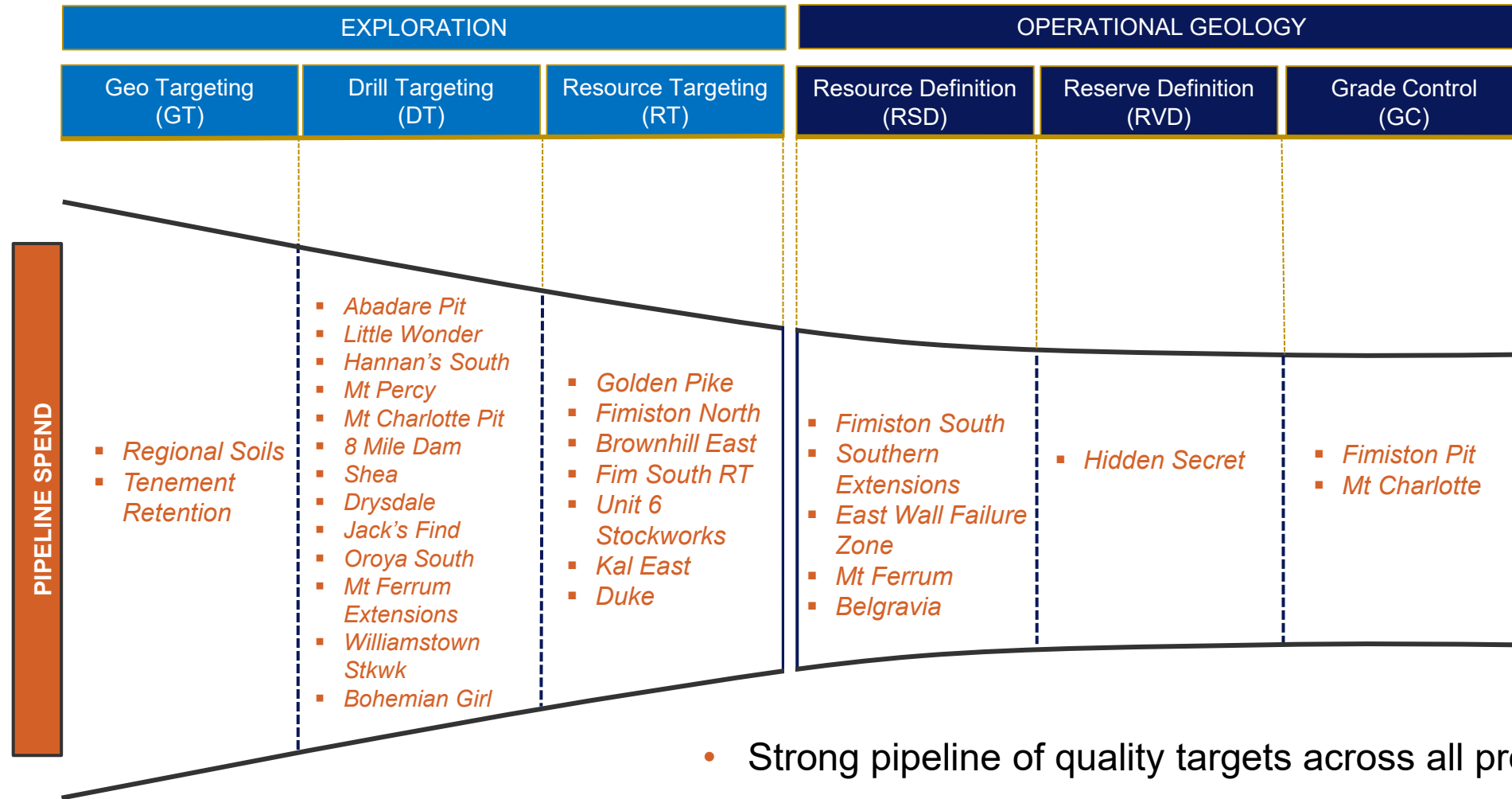
Mineralisation remains open in all directions



More than 5.5Moz has been produced from Mt Charlotte to July 2020. Despite mining continuously since the 1960's, discoveries continue to be made in close proximity to existing workings



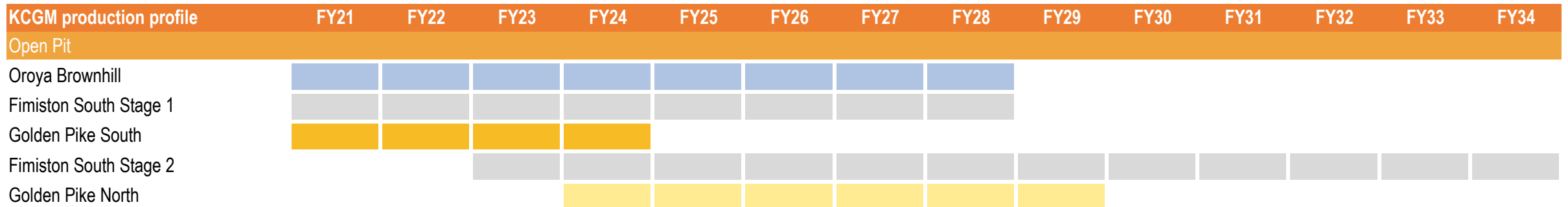
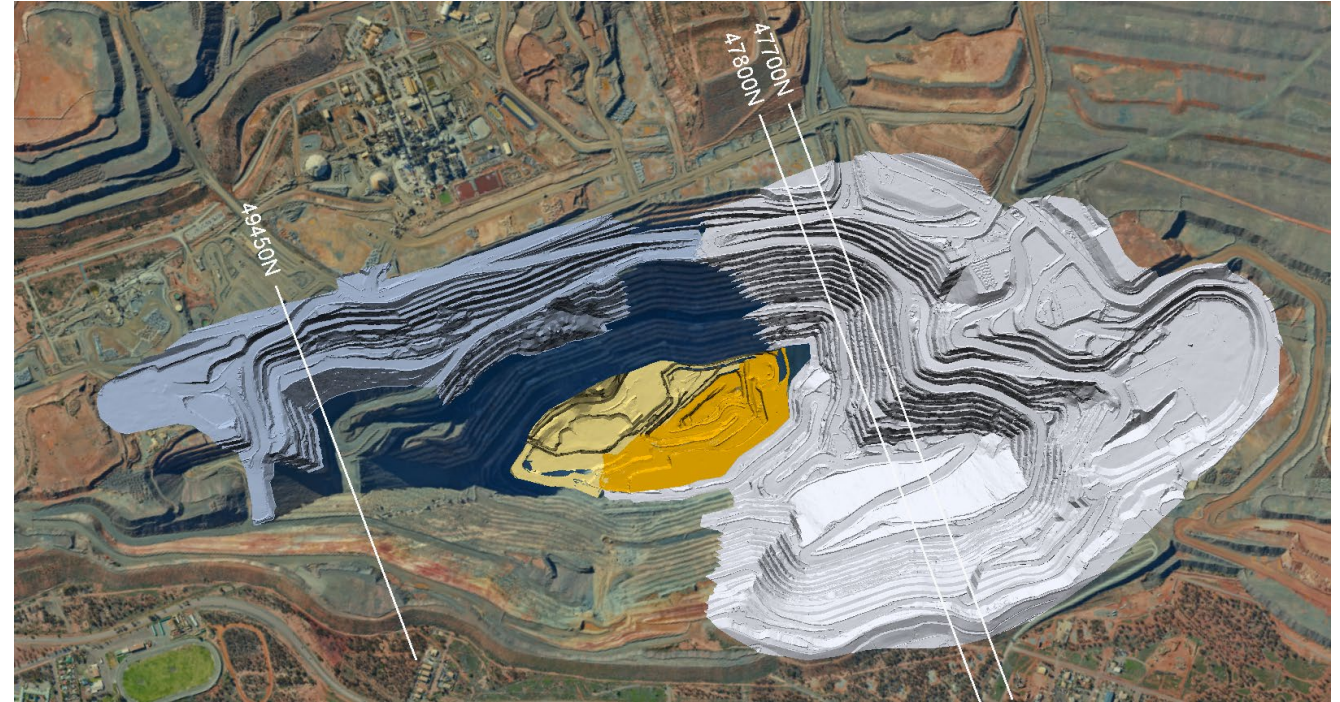
- Strong emphasis on increasing exploration in and around the Mt Charlotte operations. Existing development provides a strong platform for future growth
- Underground infrastructure has been upgraded to provide capacity for additional drill rigs
- The JV owners have committed to drill drive development to enable testing of high quality targets at appropriate drill orientations



- Strong pipeline of quality targets across all project stages
- \$12M committed in FY21 to test early stage projects

## Open pit makeover:

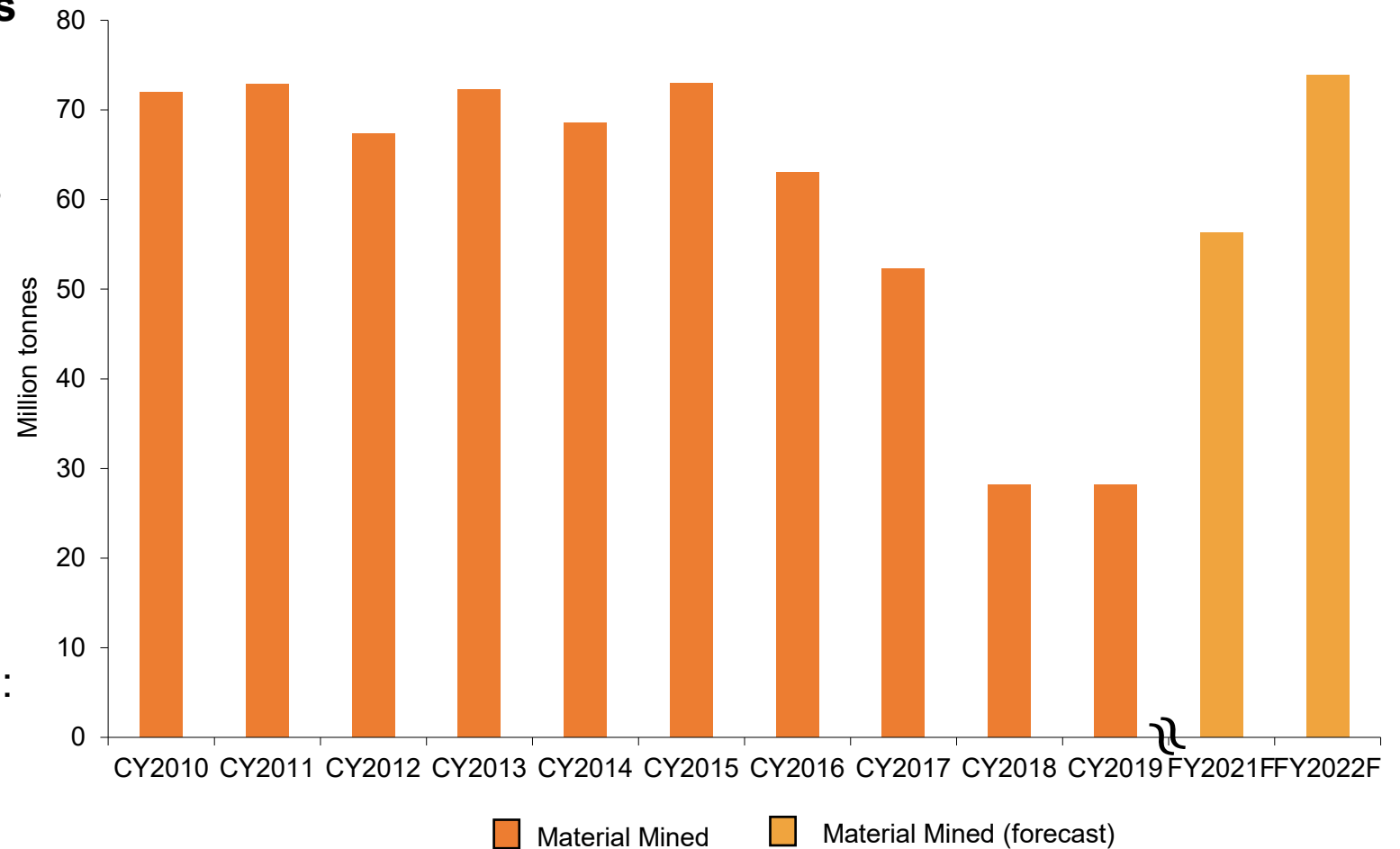
- **Mining areas doubling from two to four:**
  - Golden Pike South - underway
  - Morrison (Fimiston South starter) - underway
  - OBH - underway
  - Fimiston South - from June H 2021





## Productivity gains:

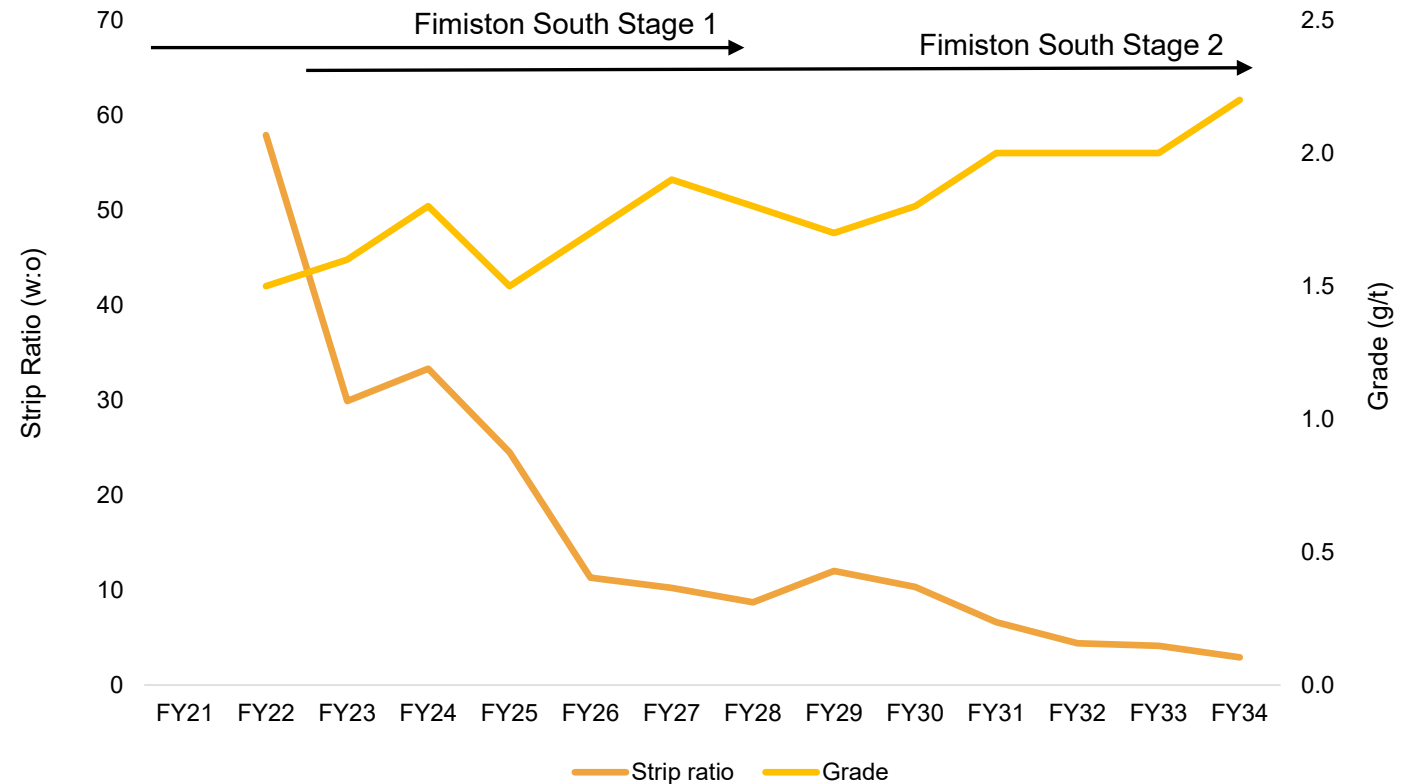
- **Targeting total material movements of 70-80Mt p.a.** in line with historical volumes:
  - Using the same large face shovels and trucks
  - Fleet renewal is underway, improving productivity
  - When between three and four cutbacks were available at any given time
- Significant gains in productivities and utilisation are already being achieved:
  - e.g. 49% improvement in total material movement in the recent June quarter 2020



## Fimiston South:

- KCGM's single largest cutback in a decade:
  - Two stage, 12 year mine life
  - 10:1 strip ratio
  - 850Mt total material movement
- Strip ratio declines from 58:1 (FY21)...
- ...to 2.9:1 (FY34)...
- ...with the grade increasing over the same period from 1.5g/t to 2.2g/t
- i.e. project economics get better every day
- Stage 1 will commence June half 2021

**Fimiston South strip ratio and grade**



## Golden Pike:

- Priority mining front due to:
  - High grades - Reserves 24Mt @ 2.0g/t for 1.5Moz
  - Low strip ratio of 2.9:1
  - Waste pre-stripping completed in the preceding ~10 years by former owners
- Mining continues at the Golden Pike South cutback
- The Golden Pike North cutback will commence in FY24, once the East Wall remediation work is completed under the new Oroya Brownhill plan
- Opportunities to fast track mining will be assessed...
- ...but not at the detriment of quality ore mining

**Golden Pike cutback**





## Oroya Brownhill:

- Mining is underway at Oroya Brownhill (OBH)
- Eight years of mining is planned in two stages:
  - Average strip ratio 9.0:1 (including pre-strip)
  - Average grade 1.5g/t
- New wall remediation plan (3.5 years) involves:
  - Bringing the Brownhill cutback forward (previously not scheduled until 2022)
  - Pushing the north-east wall back by ~80-100m
  - Integrating the east wall remediation zone with the Brownhill cutback once remediation works are completed

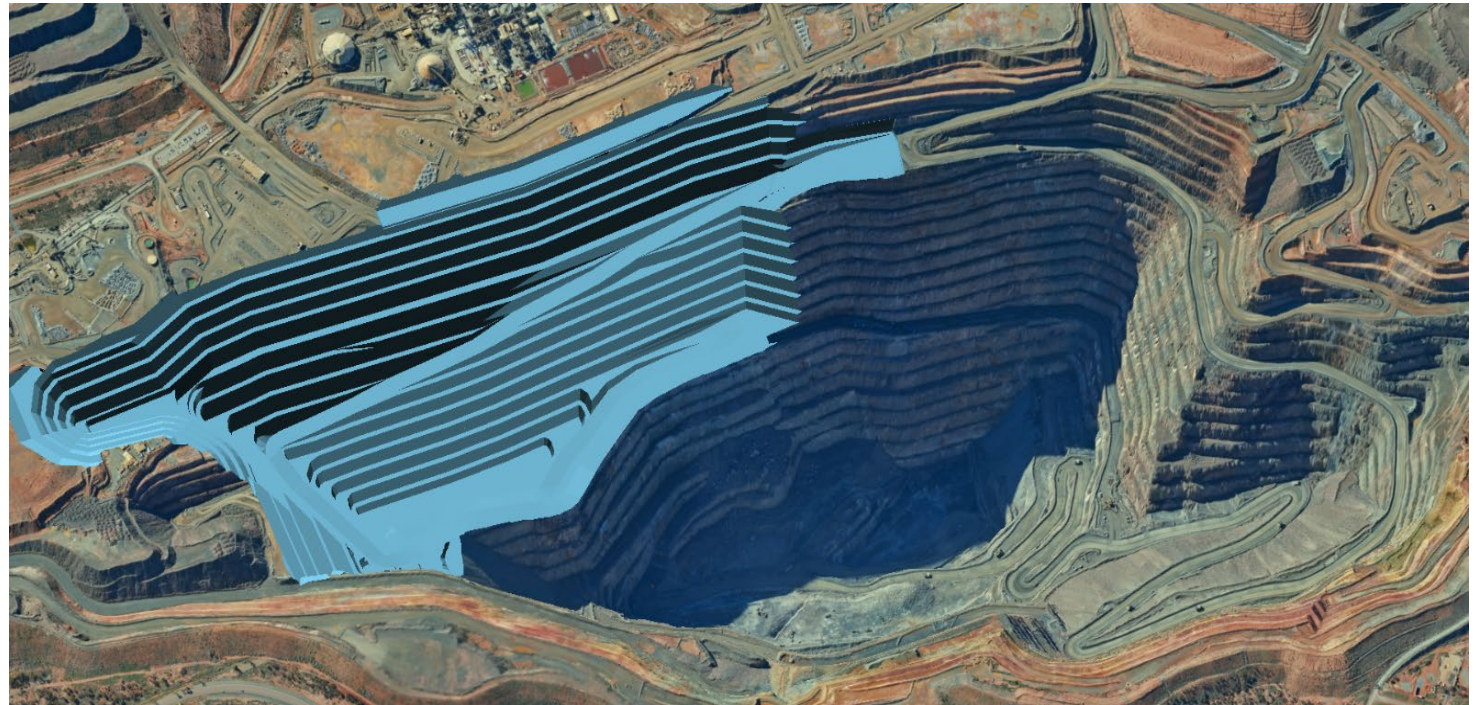
OBH cutback looking south



## Oroya Brownhill:

- Advantages of the new plan include:
  - Larger, more productive, lower unit cost mining area
  - Additional ounces offset remediation cost
  - Reduced operational risk
  - No additional approvals required
  - Remediation timeframe ~3.5 years
  - Rigorous geotechnical investigation

**OBH cutback**

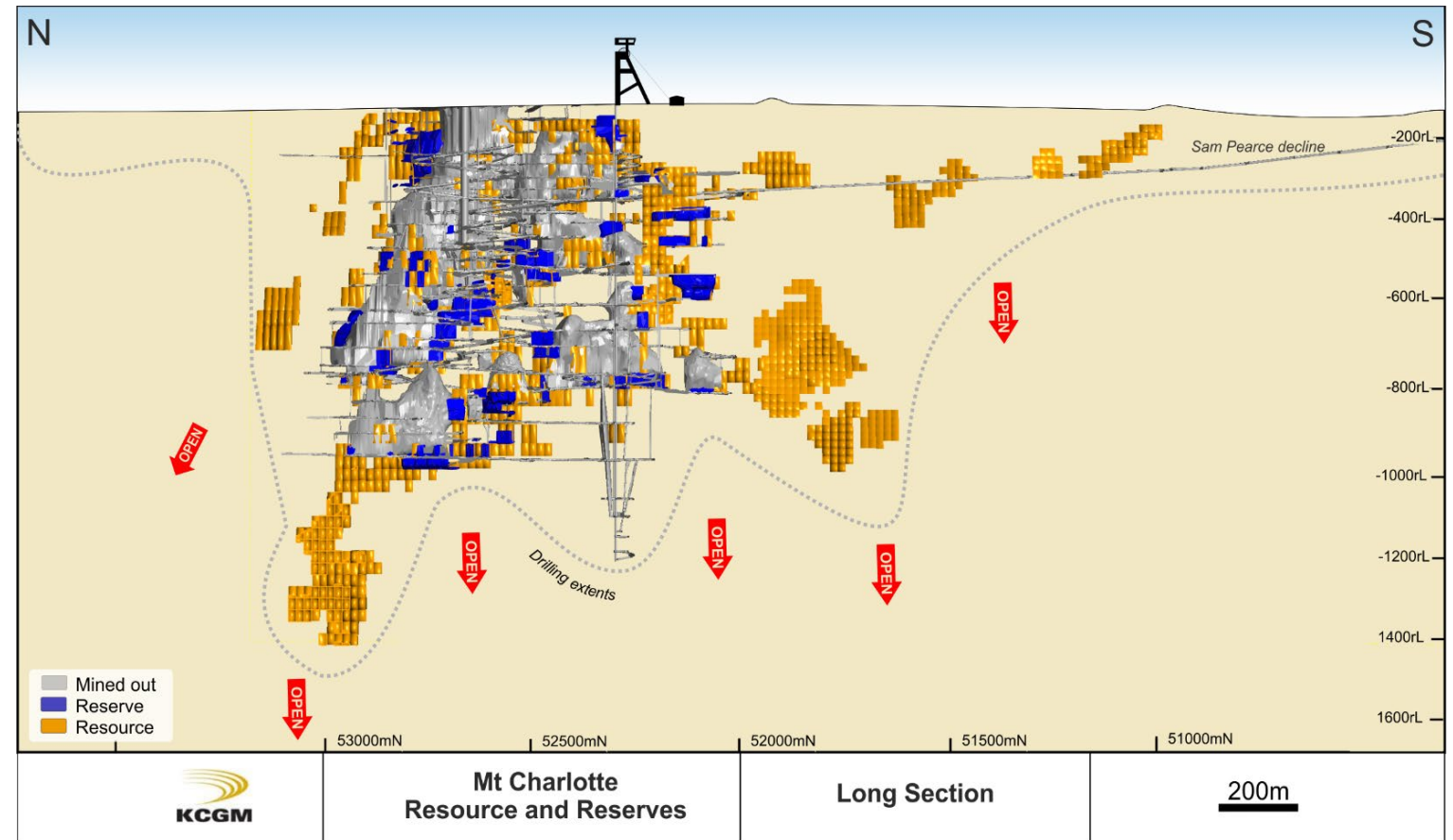




## Mt Charlotte:

- Historic production of >5.5Moz at an average grade of 3.6g/t
- A 6 month strategic review resulted in a significant increase in:
  - Reserves 510koz
  - Resources 1.9Moz
- Significant progress has been made in upgrading infrastructure including:
  - Power
  - Ventilation
  - Pumping
  - Ground support in the decline

**Mt Charlotte Long Section**

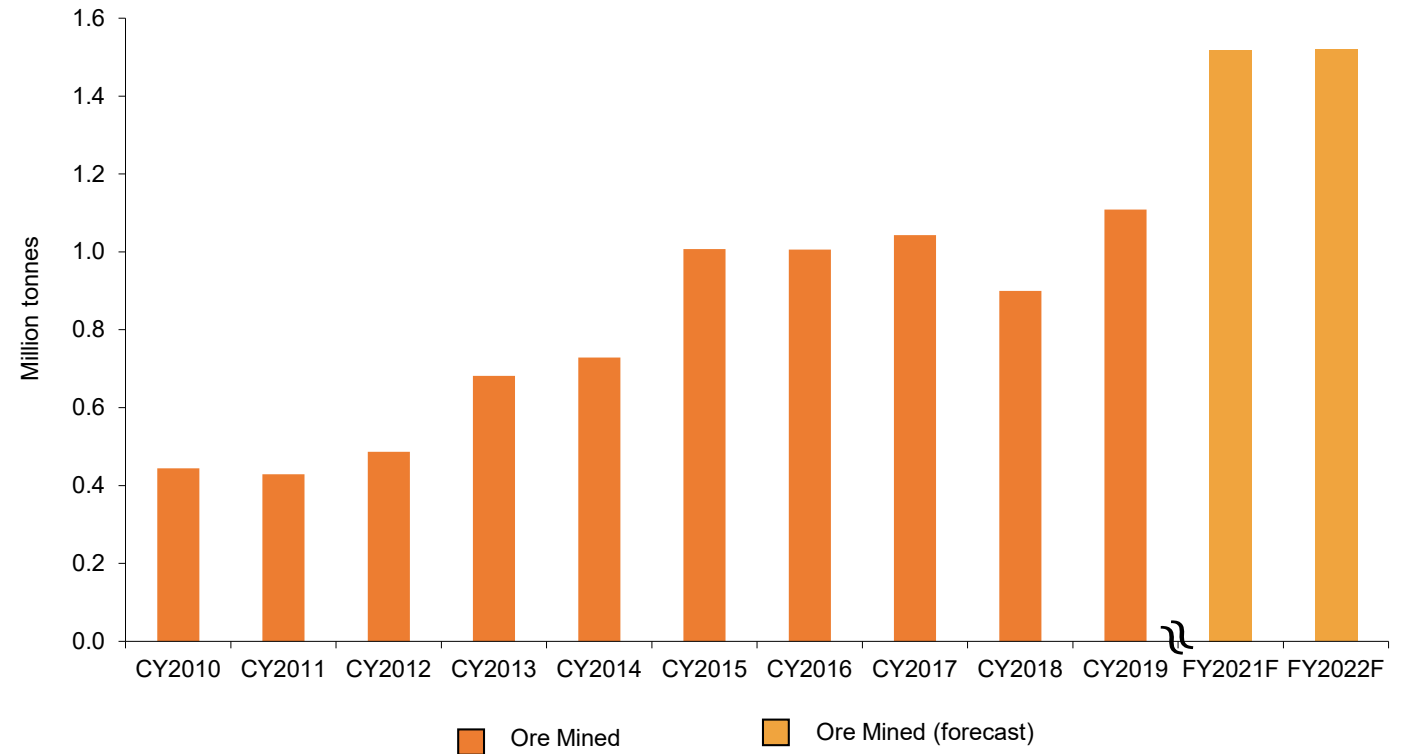




## Mt Charlotte:

- Strong increases in underground productivities achieved by the new owners
- *For example, in the June quarter 2020 mined ore tonnes increased by 25% from the March quarter 2020*
- This follows several productivity-focused initiatives including:
  - Moving to a 24 hours per day, seven days per week operation
  - Opening new mining fronts
- Ore mined from Mt Charlotte is planned to hit 1.5Mt in FY21...
- ...substantially higher than prior years

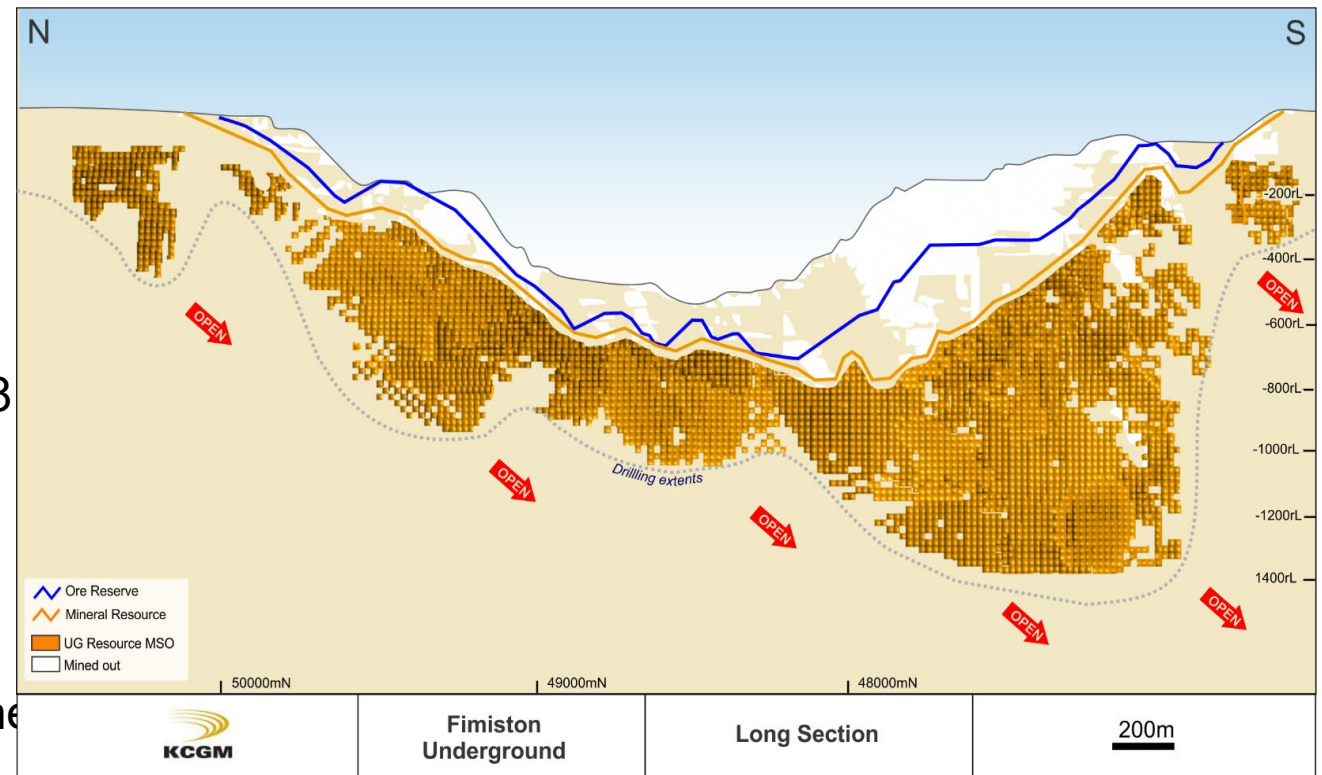
**Mt Charlotte ore mined**



## Fimiston:

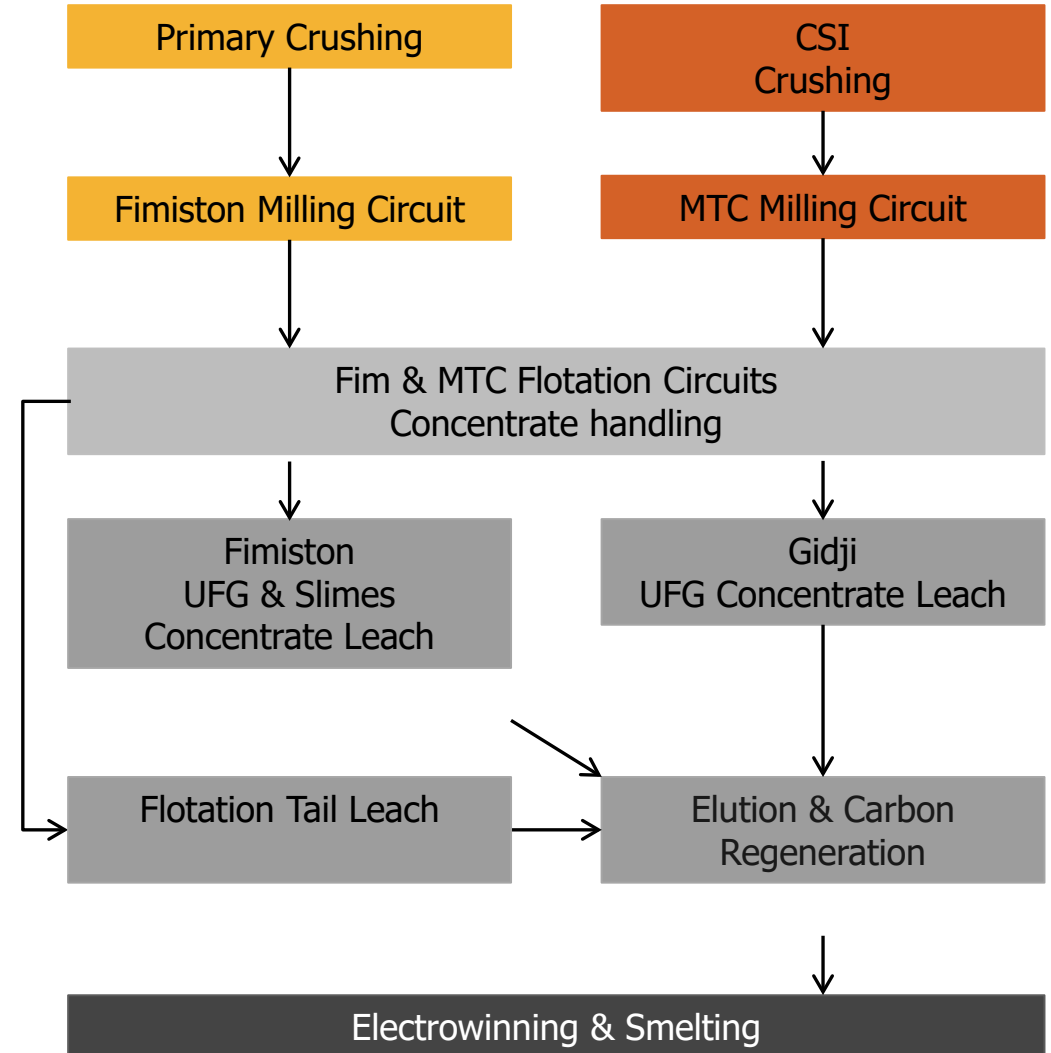
- The world-class Fimiston deposit has produced >65Moz at a mined grade of 5.0g/t since 1893
- Historic underground workings extend to ~1,400m below surface
- Historic drilling intersects mineralisation at depths of >2km
- Maiden underground Resource of 25.0Mt @ 2.8 g/t for 2.2 Moz
- A\$10m will be allocated in FY21 to:
  - Establish multiple in-pit portals
  - Re-establish underground access beneath the open pit
  - Provide drill platforms to infill and extend the current Resource

Fimiston Underground long section



## Overview:

- ~13 Mtpa capacity, processing primarily sulphides ore
- Crush, grind, flotation and CIL
- The majority of flotation concentrate is processed through ultra fine grinding (UFG) followed by CIL at Gidji.





## Q1 overview:

- Annualised rate = 13 Mtpa
- Tonnes processed ↑6% budget due to higher than budget mill throughput and mill availability
- Site Recovery ↑1.7% budget at 83.6%

## Key focus:

- Operating cost optimisation, currently 7% improvement on forecast
- Throughput and recovery optimisation studies commenced

### Q1 Summary

	Actual	Budget	Variance
Processing tonnes (kt)	3,265	3,080	+6%
Head Grade (g/t)	1.26	1.30	-3%
Recovery (%)	83.6	81.9	+2%
Gold Recovered (oz)	110,378	105,140	+5%





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Contact Details:

**Troy Irvin (SAR)**

*Corporate Development Officer*

phone: +61 8 6229 9100

email: [info@saracen.com.au](mailto:info@saracen.com.au)

**Kurt Walker (NST)**

*Business Development & Investor Relations*

phone: +61 8 6211 2620

email: [info@nsrltd.com](mailto:info@nsrltd.com)

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