

## **ANGLO AMERICAN SITE VISIT**

## **MOGALAKWENA MINE – PLATINUM**

**23 NOVEMBER 2016** 



Real Mining. Real People. Real Difference.

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## **MOGALAKWENA MINE – OVERVIEW**

- The Northern Limb of the Bushveld Complex is located in the Limpopo Province of South Africa
- The Northern Limb is approximately 120km in length
- Anglo American Platinum operates the Mogalakwena open pit mine – currently the only operating mine on the Northern Limb

Mogalakwena overview <sup>(1)</sup>	
Ore Reserves (Contained 4E million troy ounces)	~116.0
Inclusive Resources (Contained 4E million troy ounces)	~286.4
Potential life of complex (years)	>100(2)
Number of employees	1,816
Annual Platinum production (koz)	c.400

#### Mogalakwena mine



#### Mogalakwena - drilling and load and haul operations



- (1) For the detailed breakdown of Ore Reserve and Mineral Resource estimates (as at 31 December 2015) classification categories, please refer to the AAP Ore Reserves and Mineral Resources 2015 Report.
- (2) Indicative of potential life of complex assuming renewal of Mining Rights and conversion of resources to reserves. Official reserve life of mine is 25 years, reflecting reserve Life being truncated to the last year of current Mining Right.

## **MOGALAKWENA LEADERSHIP TEAM**

#### World class leadership team adding value through the cycle

Hermann Hollhumer Engineering Manager



Bongani Mtshweni HR Manager

Allan Hartley Finance Manager

Judd Barlow Production Manager





Frans Marais SHE Manager

Ashina Buddu Concentrator Manager





Richard Cox General Manager



Wynand Smit
Bus. Partner Technical

Hendrik van Niekerk MRM Manager



Bert Rossouw
Business Improvement Manager



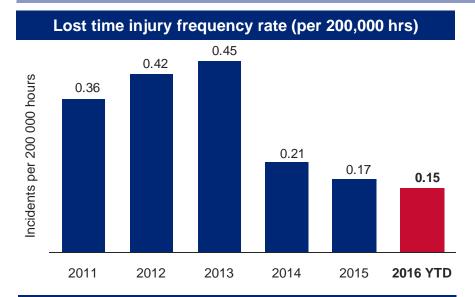


Lebang Gaobepe Social Performance Manager

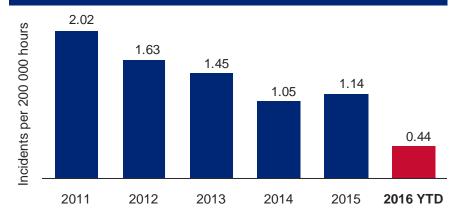


## SAFETY PERFORMANCE

#### Safest platinum mine in the world



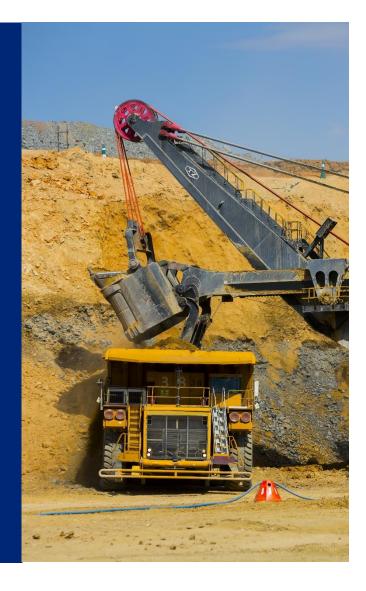
#### Total recordable case frequency rate (per 200,000 hrs)



- Mogalakwena operation benchmarks favourably with international best practice safety performance
- The team has a well structured safety strategy in place
- Risk approach and progressing priority unwanted events and critical controls
- Notable recent safety achievements:
  - North concentrator 489 days LTI free
  - South concentrator 315 days LTI free
  - Mining 226 days LTI free
  - Mogalakwena operation 4.3 million fatality free shifts (+4 years)
  - The concentrator team recently surpassed 3 million fatality free shifts (>6 years)
  - Awarded the John T Ryan award for best in class safety performance

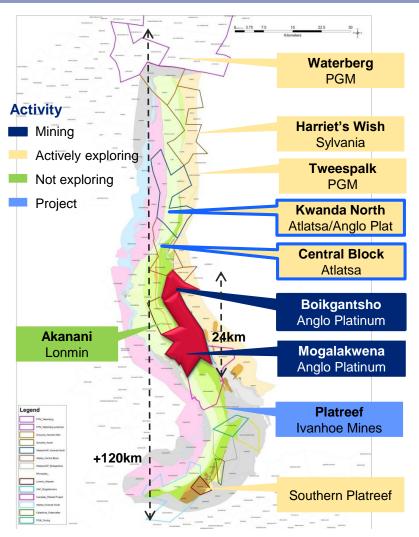


# GEOLOGY AND RESOURCES



## **GEOLOGICAL SETTING & REGIONAL ACTIVITY**

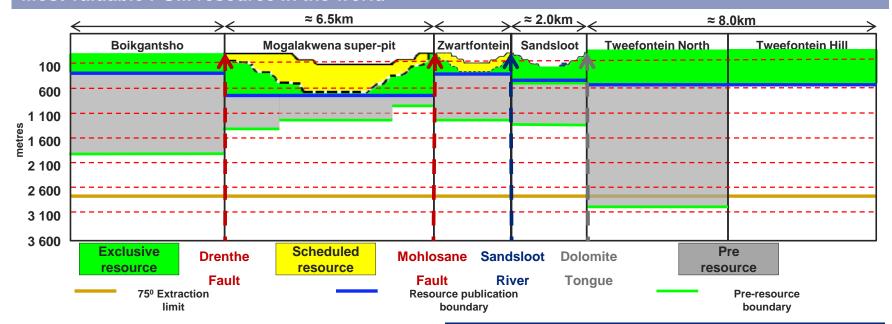
#### Uniquely positioned for open pit mining



- ➤ The Northern Limb complex of the Bushveld complex has a strike of 120km
- Mogalakwena is the only operational mine in the region currently
- The Boikgantsho mineral right added to Mogalakwena to give a strike of 24km
- It is unlikely that any other company in the region will be able to start an open pit mine of scale
- Ivanhoe Mines is actively developing an underground project
- PTM are developing the Waterberg region which sits under significant amounts of sedimentary rock

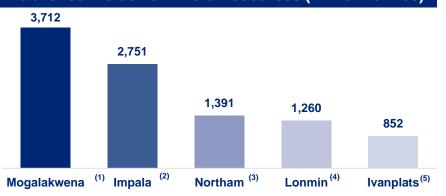
## RESOURCE ENDOWMENT

#### Most valuable PGM resource in the world



- Yellow areas are scheduled resource which is within AAP's mine plans
- Highlighted within the yellow cut outs are the profiles of current pits
- Green areas highlight the exclusive resource, excluding our scheduled resource, both of which are published as the inclusive mineral resource
- Grey areas emphasize the pre-resource. AAP does not publish Platreef pre-resource unlike our competitors

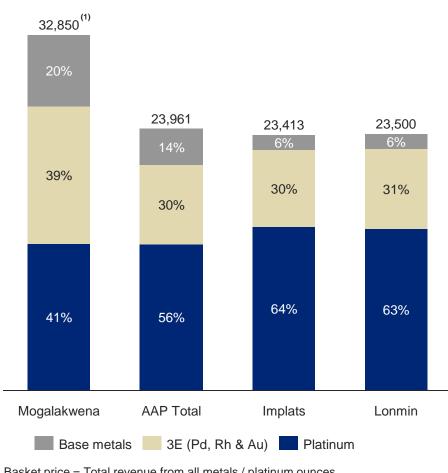
#### **Published inclusive mineral resources (million tonnes)**



### **DELIVERING VALUE**

#### Valuable basket of metals in high quality concentrate

#### 2015 revenue split between metals

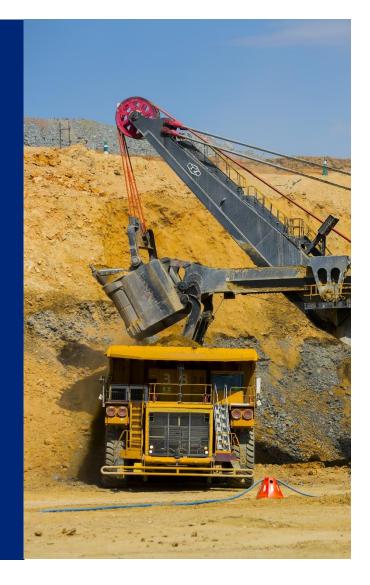


- Highest Rand basket price in the industry at R32,850 per platinum ounce
- The major differentiator of Mogalakwena concentrate is base metal loading from nickel and copper
- Relatively low amounts of impurities in the concentrate is also favourable from a smelting perspective - low chrome content

<sup>&</sup>lt;sup>1</sup> Basket price = Total revenue from all metals / platinum ounces

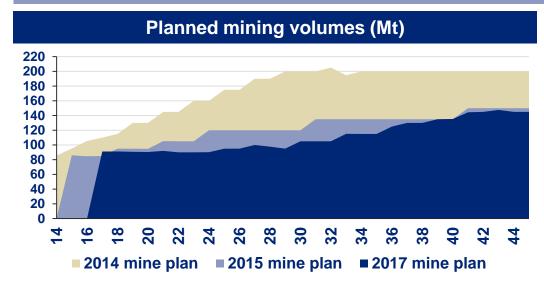


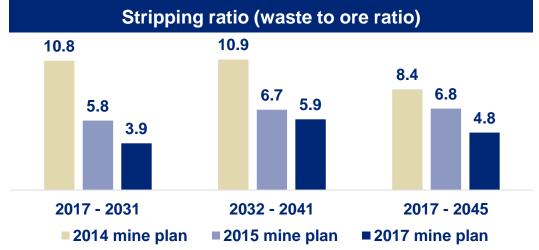
# OPERATIONAL PERFORMANCE



## A FOCUS ON CONTINUOUS IMPROVEMENT

#### Mining strategy improvements creating significant value

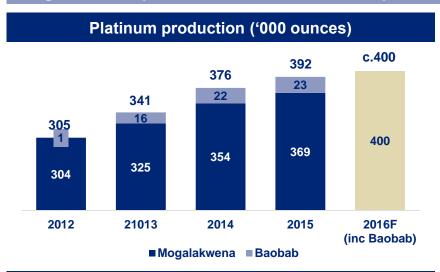




- Mine planning driving significant value
- Optimised cut-back schedule
- Strike extensions preferred to down dip pushbacks
- Slope angle optimisation
   leading to further reduction
   in stripping ratio
- For period 2017 to 2045reduced waste mining by ~374Mt

## DELIVERING HIGHER PRODUCTION AND CASH FLOW

#### Mogalakwena production continues to improve



#### Unit cost (R/Pt oz) & Cash operating margin (%)

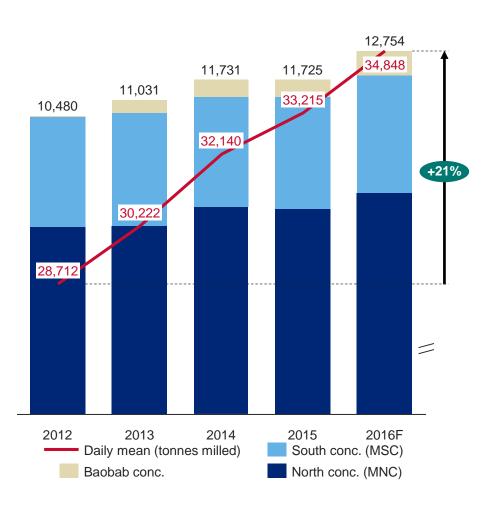


- Record production performance in 2015up 6% to 392 koz
- Forecast to improve production in 2016
- Unit costs reduced 7% in 2015 due to cost management and productivity initiatives
- Highest Rand basket price in the portfolio at R32,850 per platinum ounce
- Generated R4.4bn of economic free cash flow
- Cash operating margin maintained at 50% despite weaker prices due to benefit of the basket of metals

## A FOCUS ON CONTINUOUS IMPROVEMENT

#### **Ongoing concentrator improvements**

#### **Annual throughput (tonnes milled kt)**

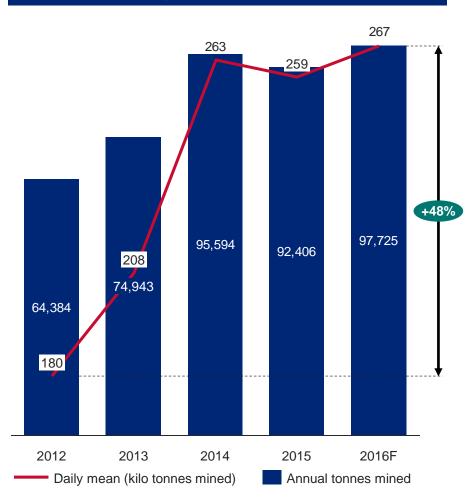


- Concentrator capacity increase exceeding expectation
- Baobab opportunity seized with further benefits to come through as a result of the Pandora transaction with Lonmin
- Asset management implemented since 2014 to eliminate defects
- Operating model implementation at North and South concentrator
- Identifying opportunities for optimisation of the North concentrator dry section to increase stability and sustainability
- Assessing recovery improvement in the wet section of North concentrator
- Expansion options study to look at where further optimisation can exist in downstream processing

### TONNES MINED

#### Focus on stability and removing volatility has led to an increase in tonnes mined

#### **Annual mining volumes (tonnes mined kt)**

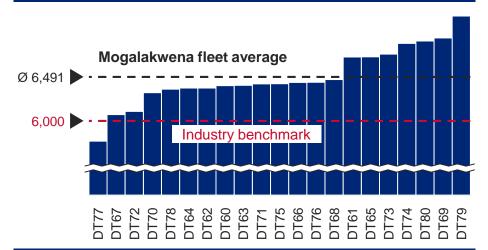


- Average daily tonnes mined increased 48% between 2012 and 2016F
- Focus on maintaining stability and removing volatility in mining
- Improvement in overall equipment effectiveness on total heavy mining equipment fleet
- Equipment availability and utilisation improved through business improvement initiatives
- Increased drilling accuracy improved blasting fragmentation
- Improvement in fragmentation positively impacting productivity to negate increased vertical lift and hauling distances

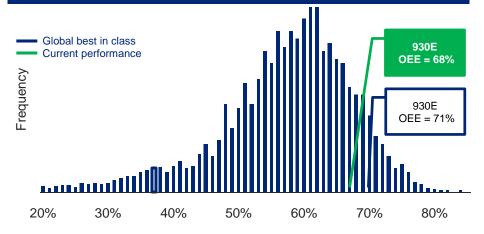
## OVERALL EQUIPMENT EFFECTIVENESS

#### World-class performance from a world-class fleet

#### Komatsu 930E truck fleet hours for 2016 (annualised)



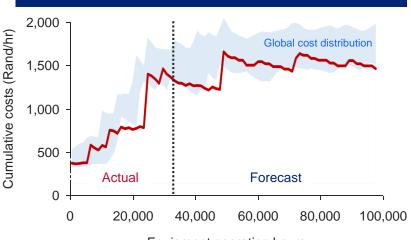
#### Global benchmark - overall equipment effectiveness



Overall equipment effectiveness (avail.% x util.% x productivity %)

- Benchmarking of 170 operations globally places Mogalakwena in the top 10% of all global Komatsu 930E truck fleets in terms of overall equipment effectiveness
- Mogalakwena fleet's annual truck hours are sustainably above industry benchmark
- Whole of life cost of the fleet trending among the lowest globally

#### Whole of life forecast - 930E fleet



Equipment operating hours

## **BAOBAB CONCENTRATOR THROUGHPUT**

Baobab increasing throughput with further value to be realised from Pandora transaction

#### Baobab average monthly throughput (kt milled)



- Optimised feed ore ratio resulting in increased throughput
- Integrated into Mogalakwena North concentrator dry circuit

#### **Baobab tonnes treated (kt)**



- Additional value will be realised through logistical optimisation of both ore crushing and ore transportation
- As a result of Pandora transaction, will be able to treat ore from mining productivity improvements and from value accretive stockpile blending

## SOCIAL PERFORMANCE CLIMATE

#### Community relations improving through engagement at all levels

- Good relations with the National Union of Mineworkers (NUM) – the major union
- All engagement structures in place and effective
- High literacy level with minimum entry level matric mathematics and science
- Challenge on improving literacy levels (employment pipeline)
- High performance culture
- 93% of our total workforce are local
- Weekly bilateral leadership forum is in place
- Several award winning community engagement projects
- Three communities have been relocated, two in total and one near completion
- Line management direct involvement with communities yielding results



Mogalakwena Groenfontein Training Initiative, a partnership with local residents from surrounding villages



Aletuke Community Centre, built by Mogalakwena Mine. Pictured, community members being trained to be community care givers

## CONCLUSION

- World class operation in the Northern limb with the only operational open-pit mine
- Safest platinum mine in the world no fatalities for 5 years
- Extremely long life asset with large reserves and resources
- Expansion potential but competing for capital in current environment
- Sustainable production no major project capital needed to increase production 31% since 2012 – but maintained waste stripping and SIB capital
- Focus on community relationships as our social license to operate





Q&A