



# EXTENDING THE ECONOMIC LIFE OF WITWATERSRAND ORE BODIES

**The orebody dictates**

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# HARMONY'S OPERATIONS **AND** RESERVES

## HARMONY IS A GOLD MINER WITH A GROWING COPPER PORTFOLIO IN PNG

### South Africa



9 underground operations ■●

1 open pit mine ▲

Multiple surface sources ●

### Papua New Guinea



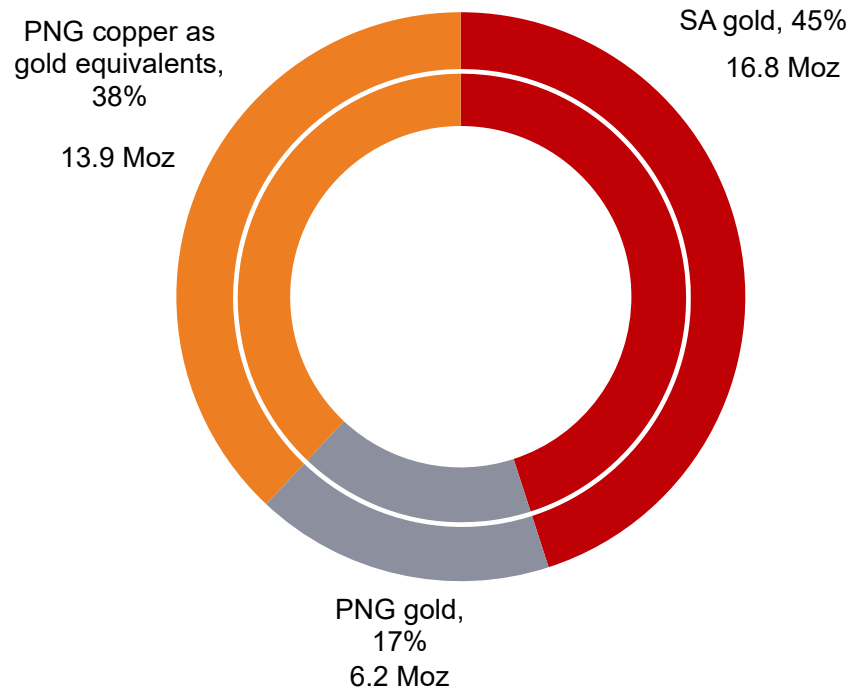
Kili Teke discovery (100% owned) ■

1 open pit mine (50:50 JV) ▲

Golpu project (50:50 JV) ●

Multiple exploration areas (50% and 100%)

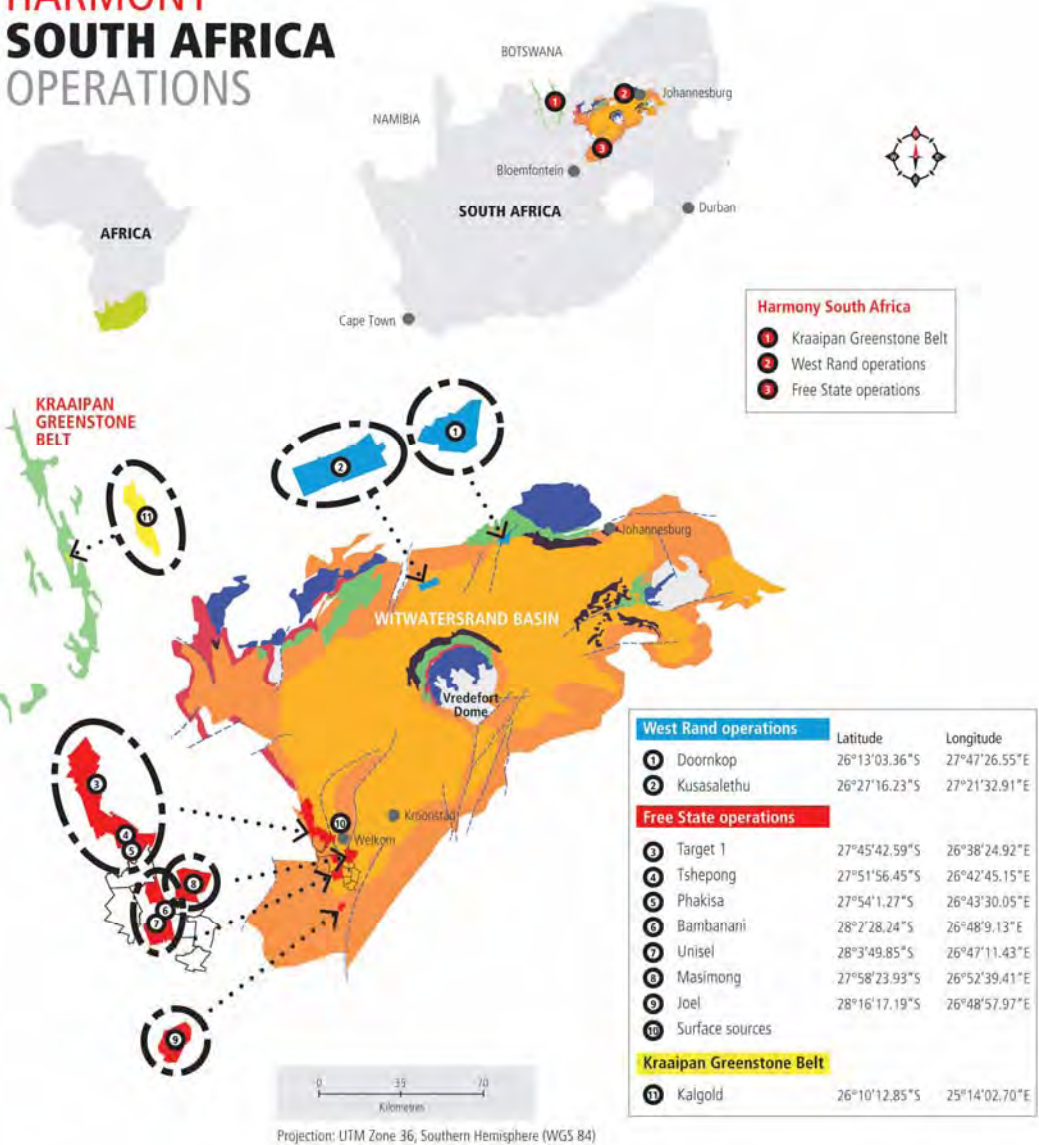
## QUALITY RESERVES (GOLD EQUIVALENT) SPLIT



- ◆ Total reserves of 36.9 Moz
- ◆ Total resources of 105.2 Moz



# HARMONY SOUTH AFRICA OPERATIONS

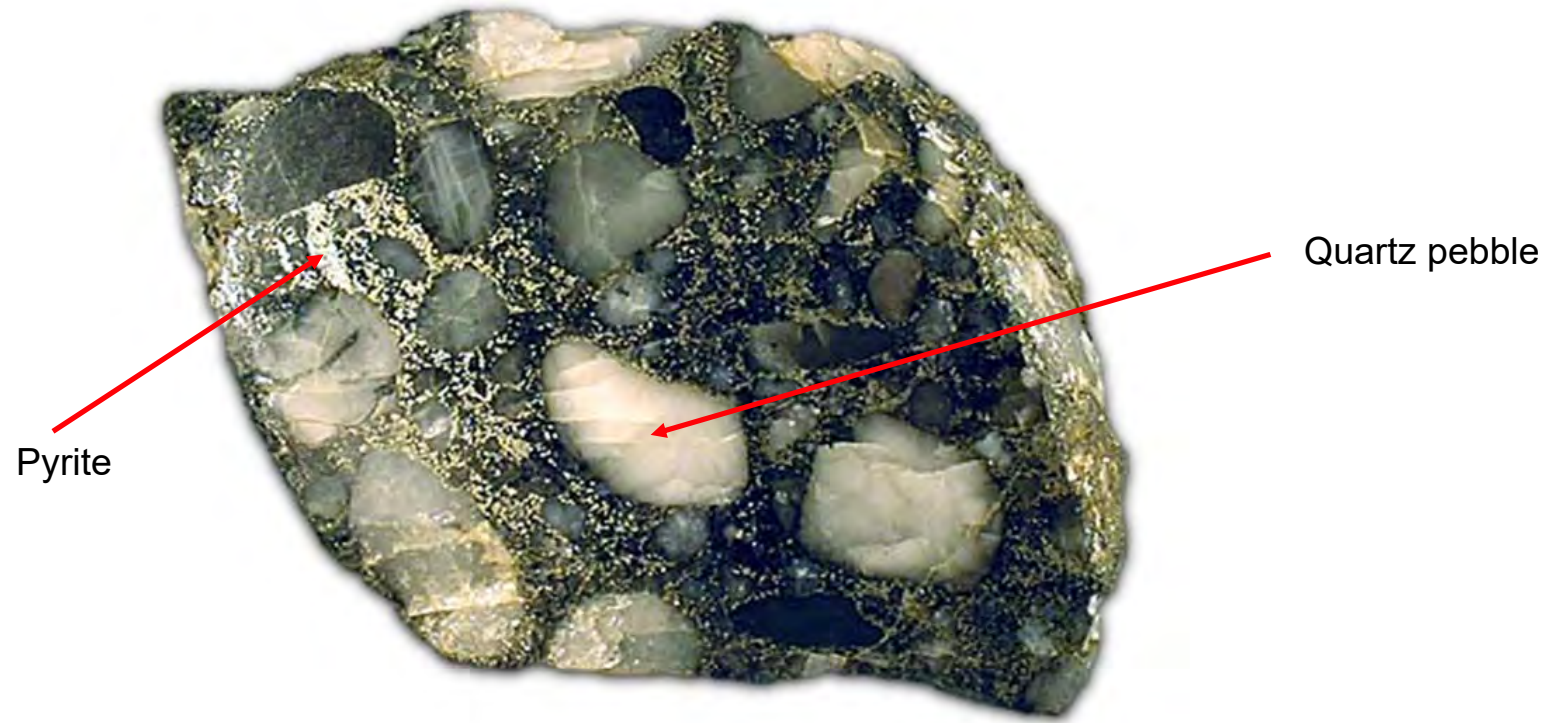




WITWATERSRAND SUPER**GROUP**  
OVERVIEW



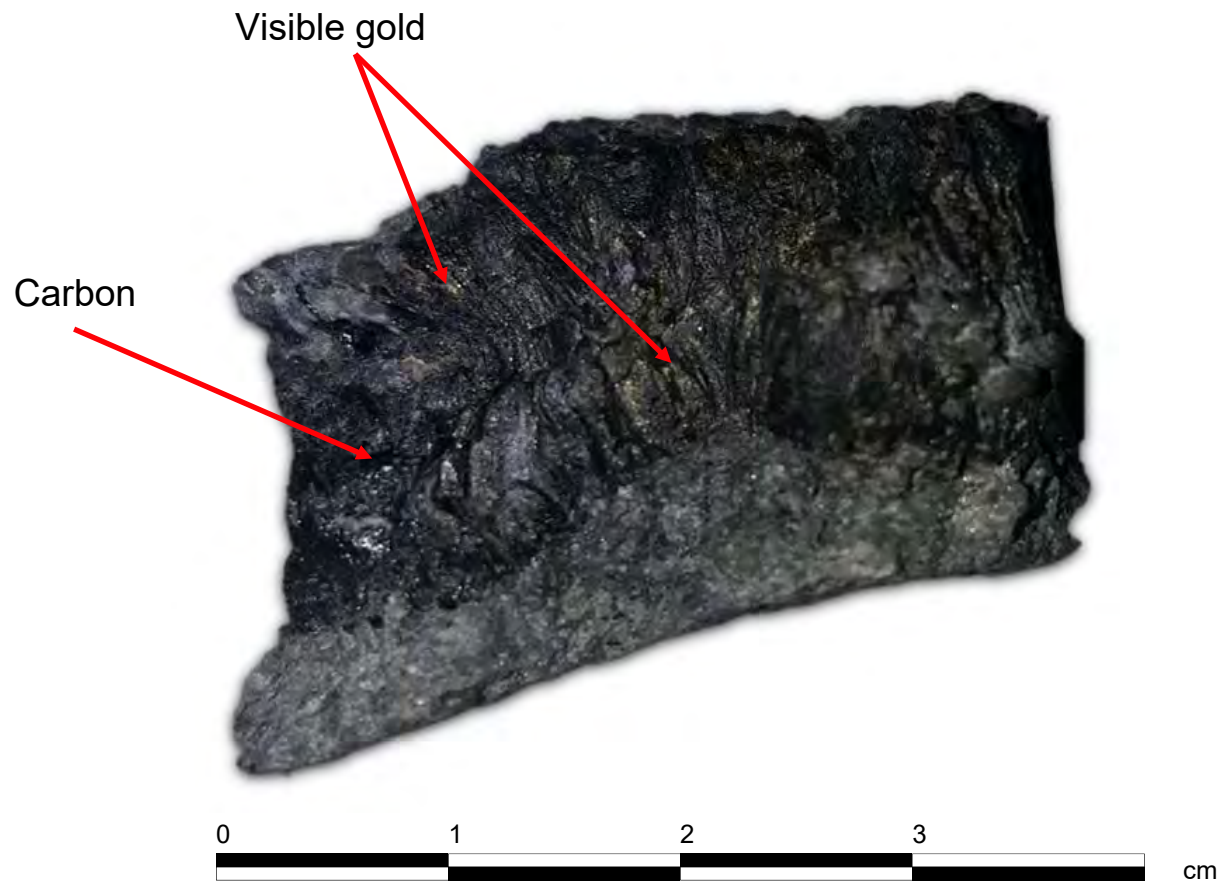
# GOLD BEARING WITWATERSRAND CONGLOMERATE





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**GOLD BEARING WITWATERSRAND CONGLOMERATE**





## WITWATERSRAND SUPERGROUP

- ◆ 2 900 million years old
- ◆ About an 8km thick sedimentary sequence
  - represents the preserved remains of a massive inland lake
  - in which silt and gold deposits from alluvial gold settled
  - forming the gold-rich deposits that South Africa is famous for
- ◆ Gold concentration by sedimentary processes unique in contrast to most of world's gold deposits that occur in quartz and carbonate veins in fault zones
- ◆ Witwatersrand Basin remains the world's largest gold resource
- ◆ Gold discovered in 1886, Johannesburg
- ◆ To date the Wits Basin has produced more than 2 billion ounces of gold



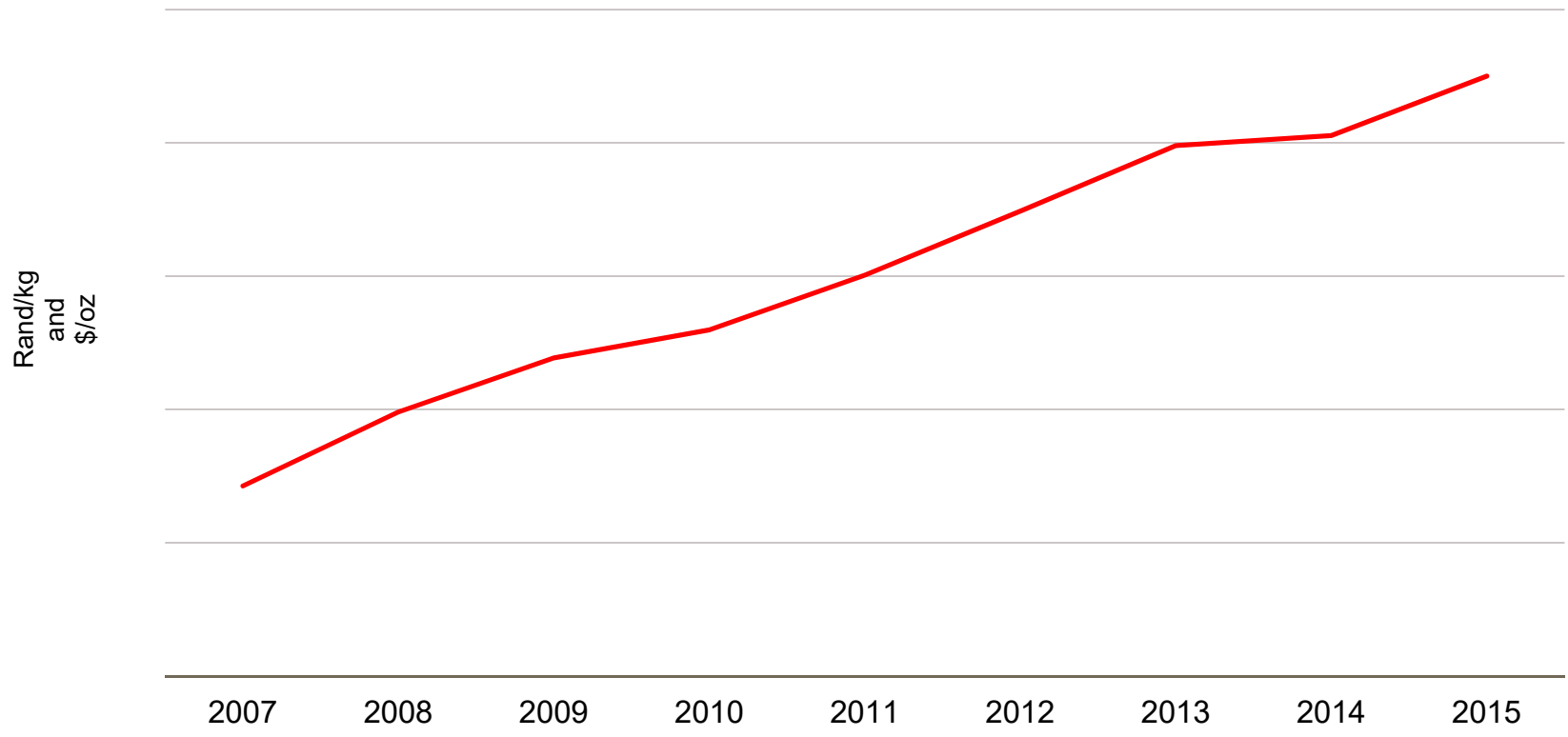
DEEP LEVEL  
GOLD MINING CHALLENGES

# ANATOMY OF A DEEP LEVEL UNDERGROUND GOLD MINE





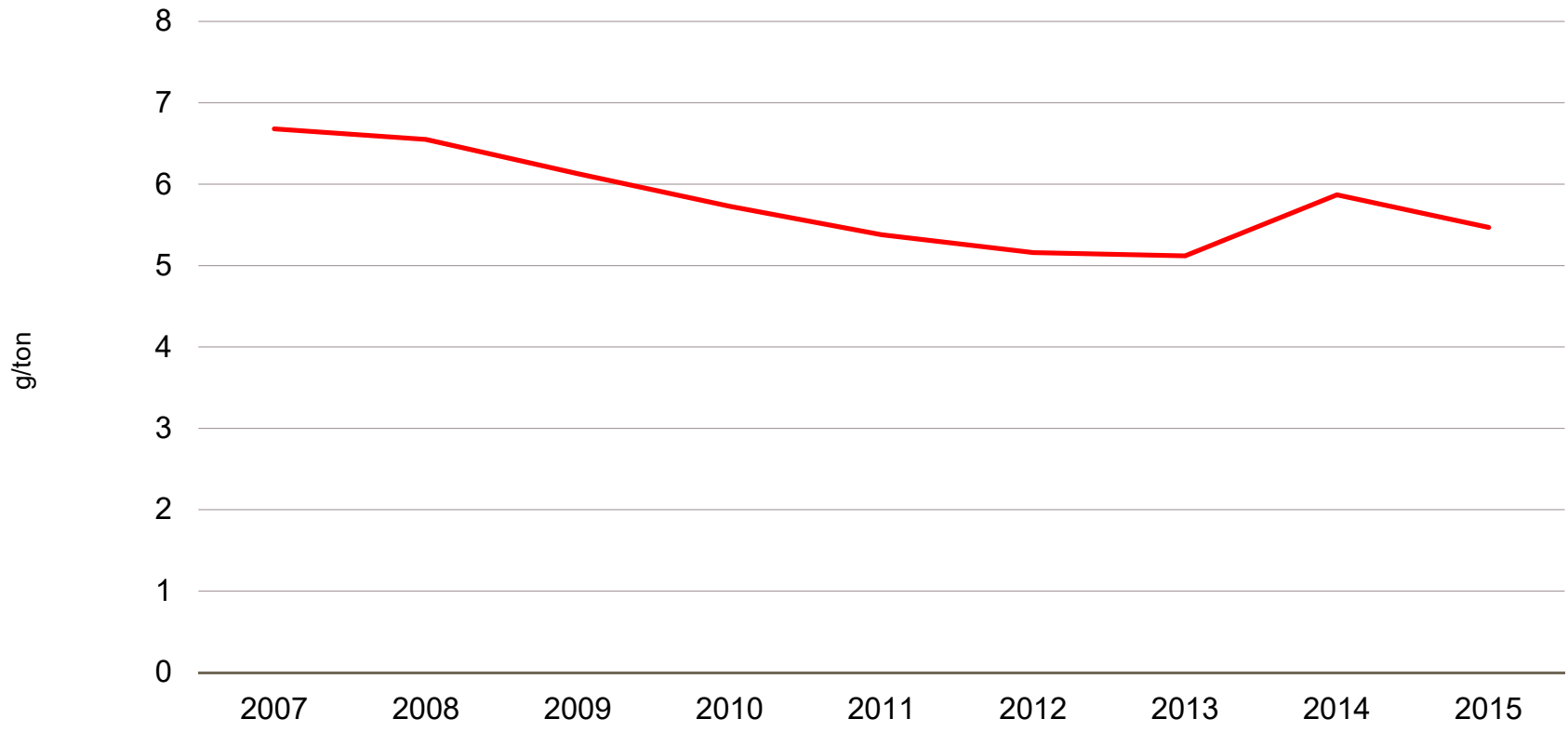
## TREND OF INCREASE IN UNIT COST





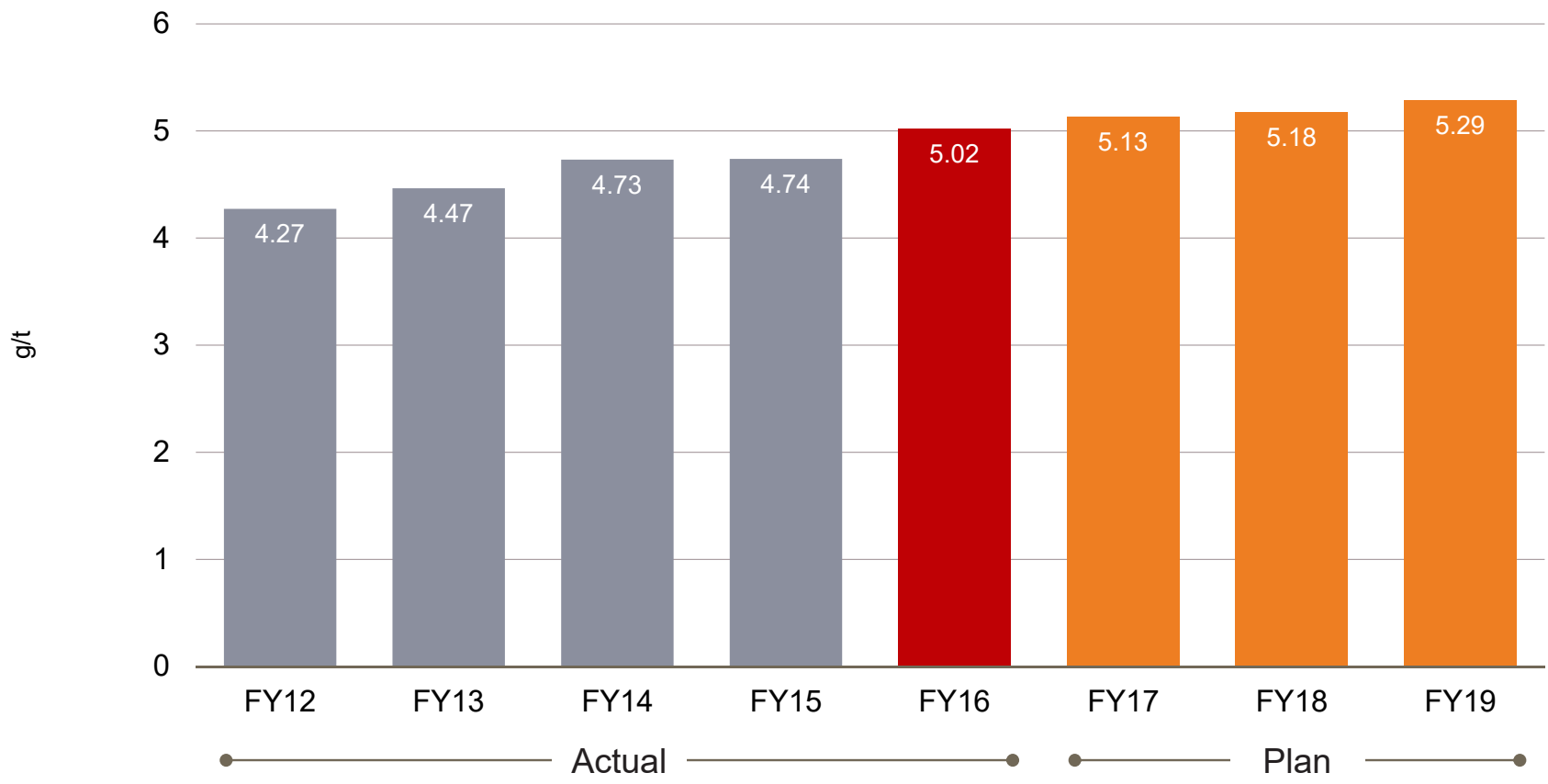
## DECLINING UNDERGROUND GRADES AND DEPLETING RESERVES

### Underground recovered grade – SA gold mining industry





## ....UNDERGROUND RECOVERED GRADE AT HARMONY INCREASING





HARMONY'S APPROACH **TO**  
DEAL WITH INCREASING **COST**  
AND DECLINING GRADES



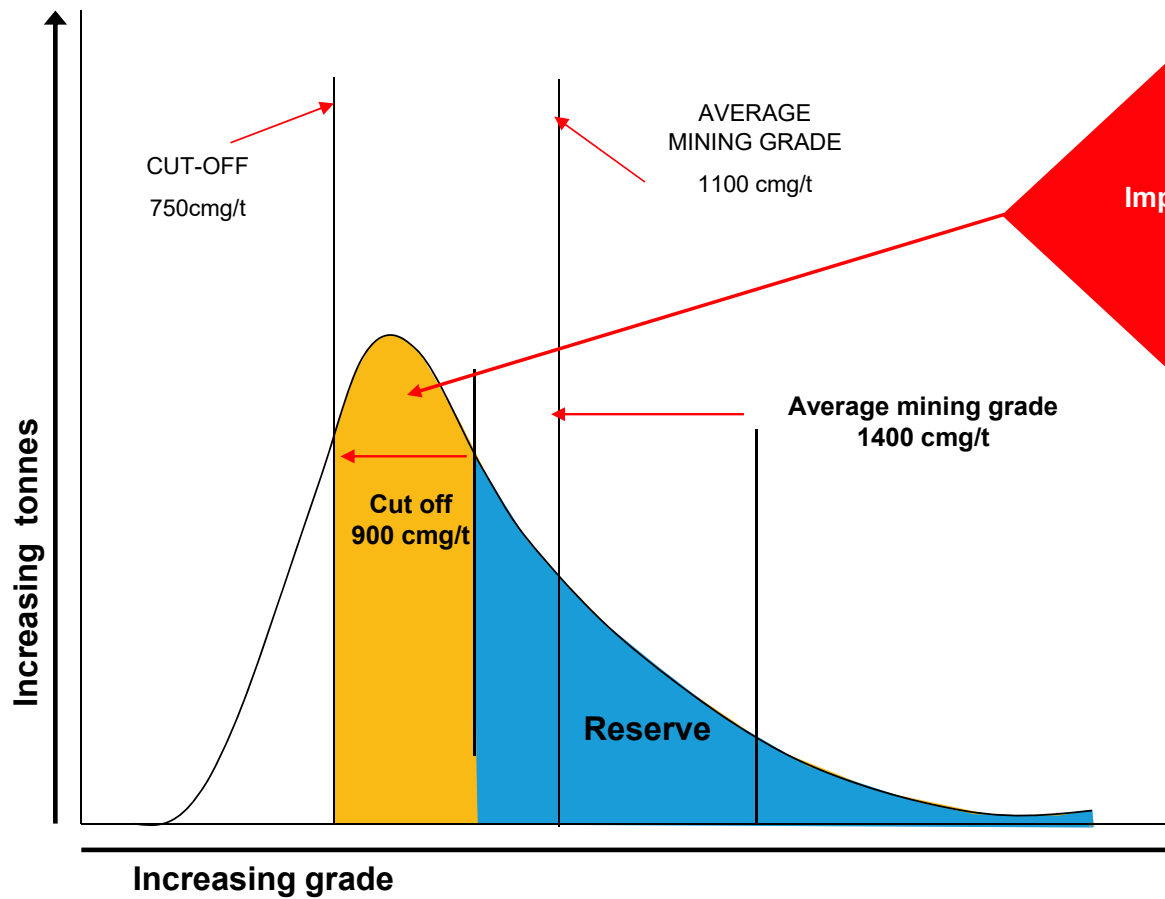


## HARMONY'S APPROACH TO DEAL WITH INCREASING COST AND DECLINING GRADES

- ◆ Ore reserve management
- ◆ Cost management
- ◆ Disciplined mining

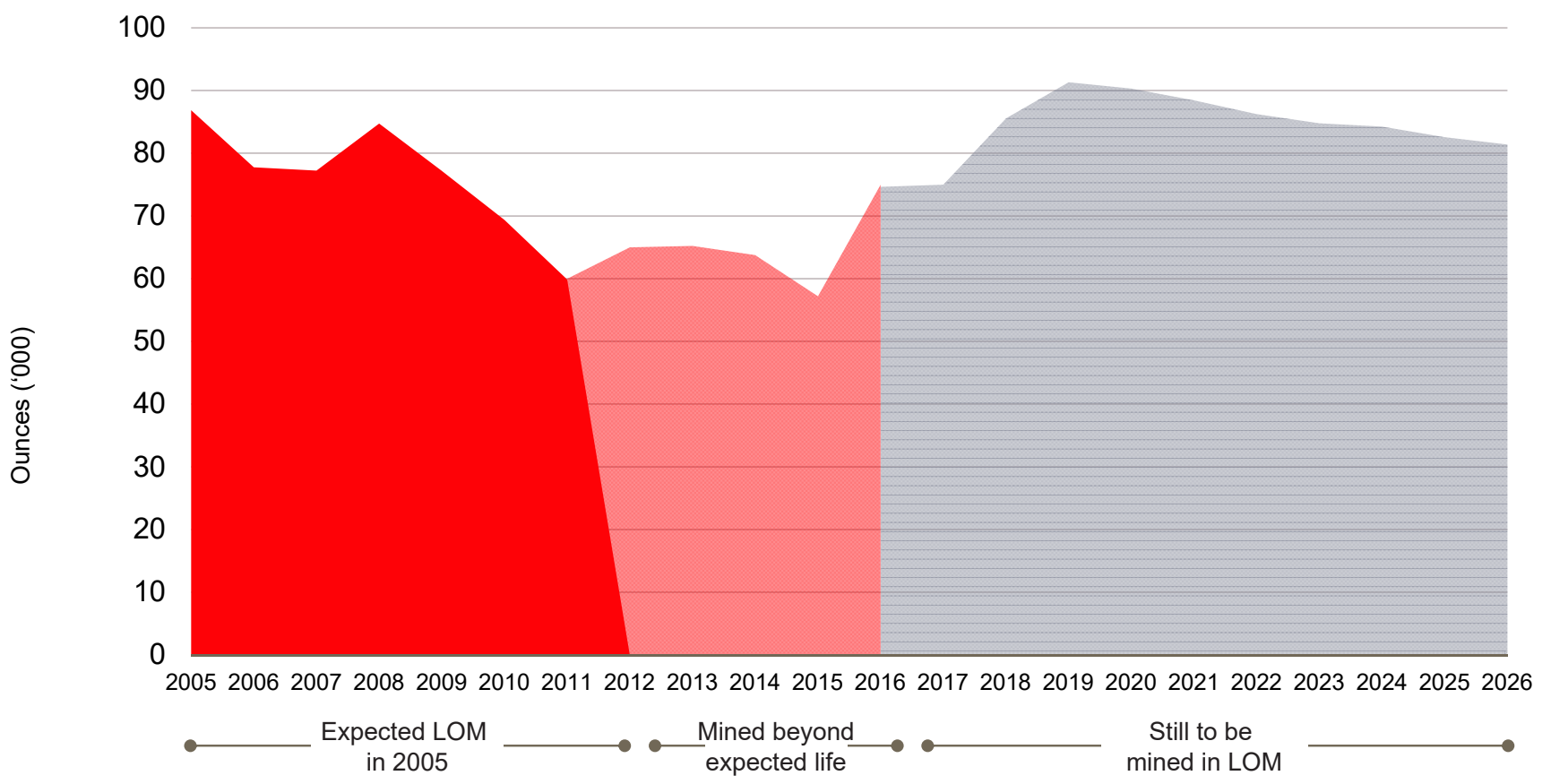
## ORE RESERVE MANAGEMENT

### Cut-off and average mining grade

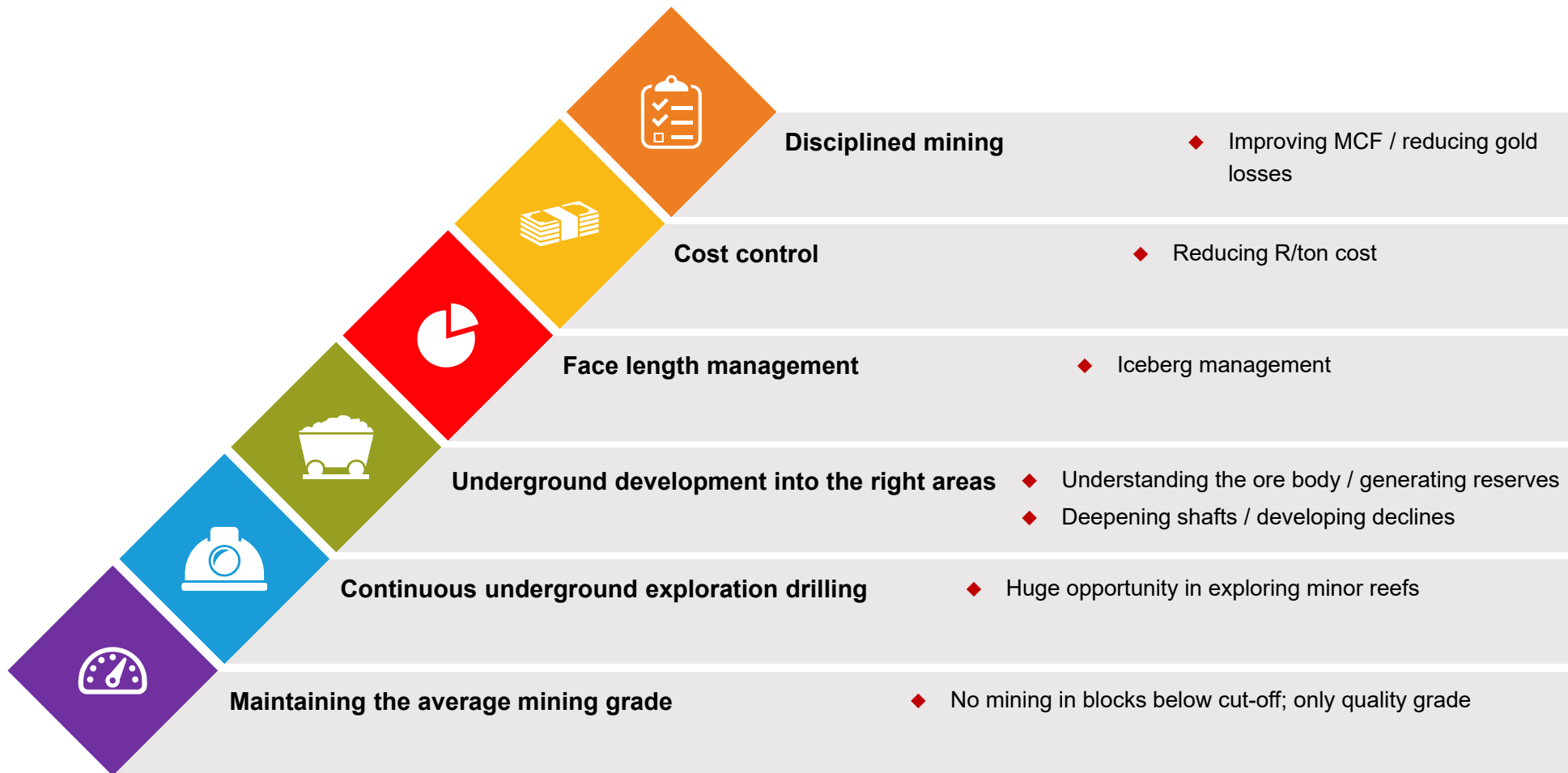


## EXTENDING THE ECONOMIC LIFE

### Increase in reserves (Actual example of one of Harmony's operations)



## WHAT MAKES THE DIFFERENCE?





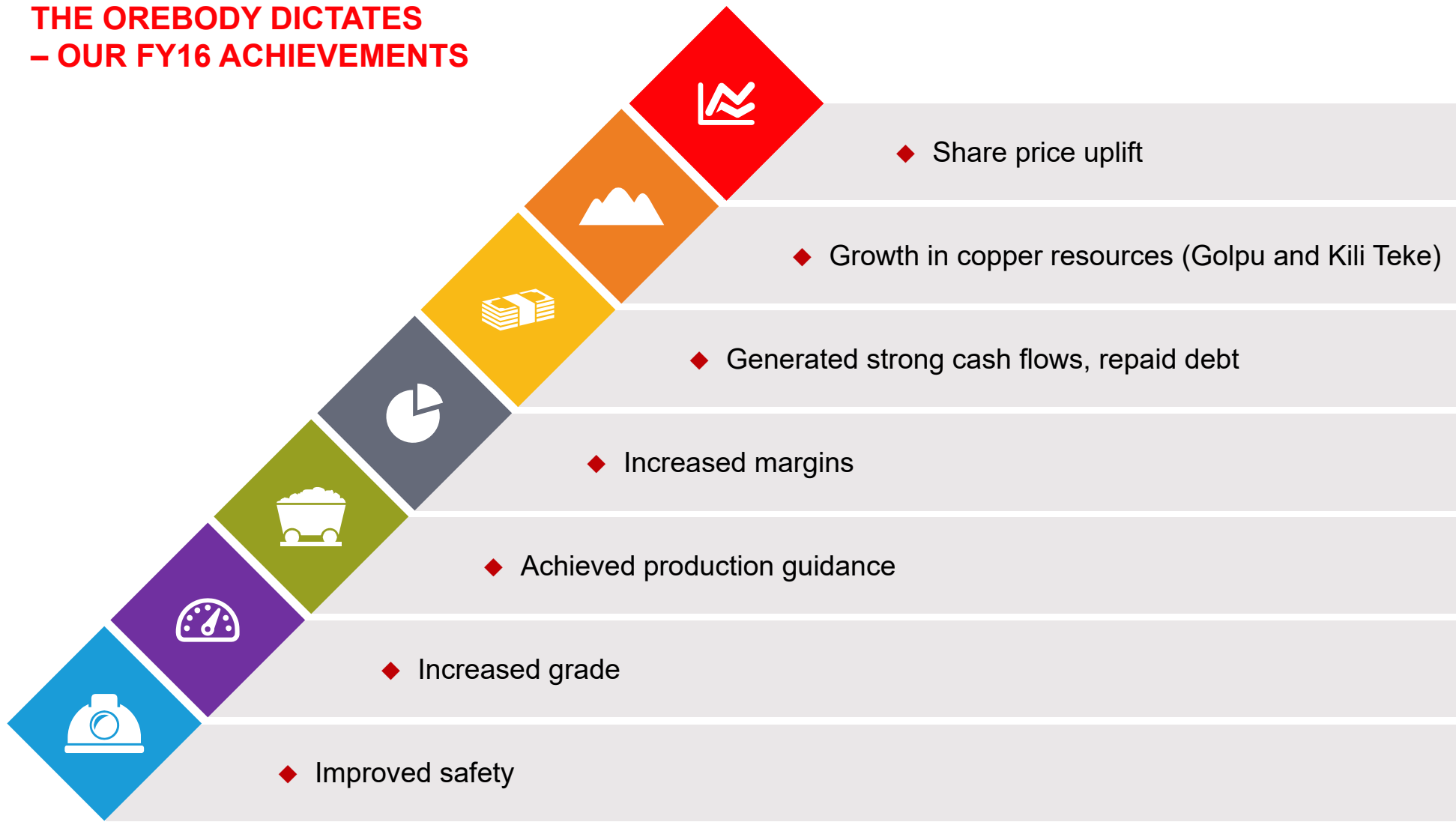
CONCLUSION



## MORE UPSIDE

- ◆ Significant resources to be converted to reserves in the Witwatersrand
- ◆ Harmony's approach to ore reserve management, cost control and disciplined mining has shown it is possible to increase the margins and extend the economic life of Witwatersrand ore bodies

# THE OREBODY DICTATES - OUR FY16 ACHIEVEMENTS





QUESTIONS