

# MARULA PLATINUM

Analyst Visit - Tuesday, 5 October 2004



## Agenda



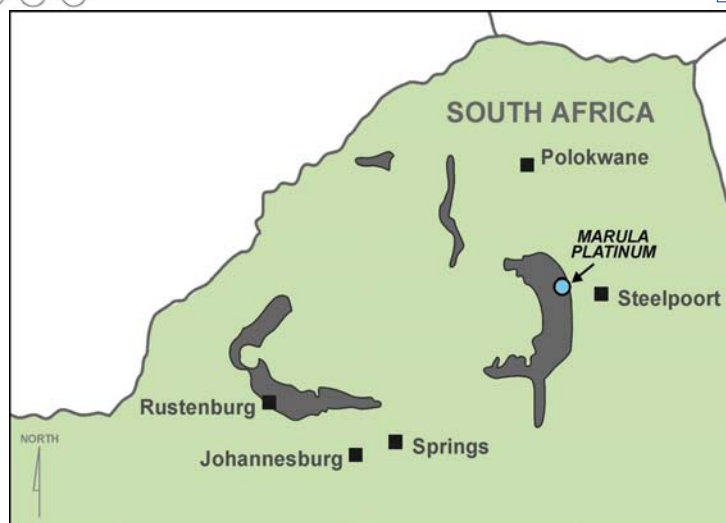
- Introduction
- Geology
- Mining
- Mineral Processing
- Safety
- Environment
- Infrastructure
- Social Involvement



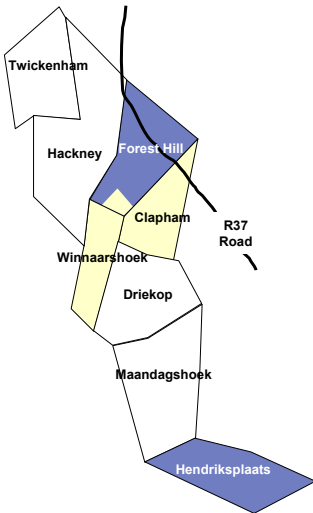


# INTRODUCTION

## Location map



## Background



- Acquired all assets of Platexco (Winnaarshoek) – R950 million in Dec 2000
- Exchanged Hendriksplaats for Clapham and portion of Forest Hill
- Sublease of portion of Driekop
- 20% Black Economic Empowerment
- Phase 1 approved in June 2002

## Capital cost (Rm)

- Phase 1 FY04
 

|                           |              |
|---------------------------|--------------|
| Mining and infrastructure | 765          |
| Process plant             | 382          |
| indirect costs            | 203          |
| <b>Total</b>              | <b>1 350</b> |
- Total revised mining plan ± 1850

## The owners of Marula Platinum



| Owner                  | %  | Role  |
|------------------------|----|---|
| Implats                | 80 | Technical, managerial, financial and operational support and expertise. Reputation allows capital to be raised for Marula Platinum and BEE owners |
| Mmakau Mining          | 10 | BEE with proven sustainability and mining expertise. Will have strategic input into Marula Platinum   |
| Marula Community Trust | 5  | Enables sustainable benefit to flow to community over life of mine and beyond   |
| Business consortium    | 5  | Long-term, committed, empowerment investor  |

## Project programme



|               |   |
|---------------|---|
| August 2002   | Construction started                                      |
| November 2003 | Commissioning started                                     |
| February 2004 | First concentrate shipped                                 |
| June 2004     | Produced 13 280 oz Pt (in concentrate) for financial year |
| June 2006     | 125 000 oz Pt in concentrate                              |

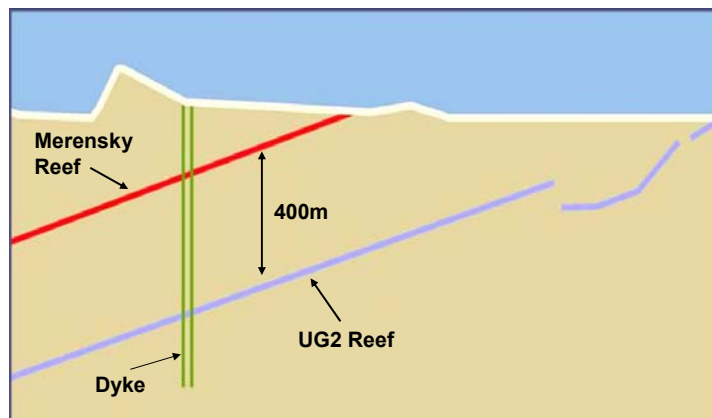


# GEOLOGY

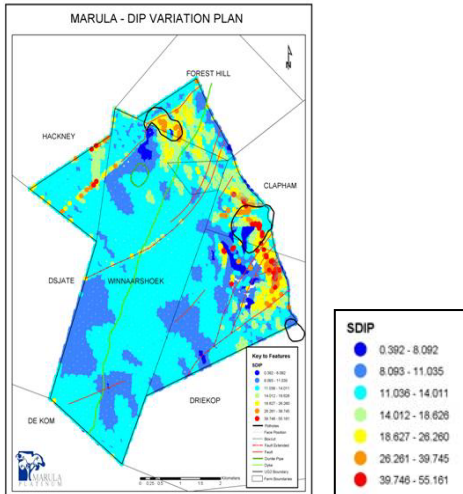
## Geology



### Generalised section of geology



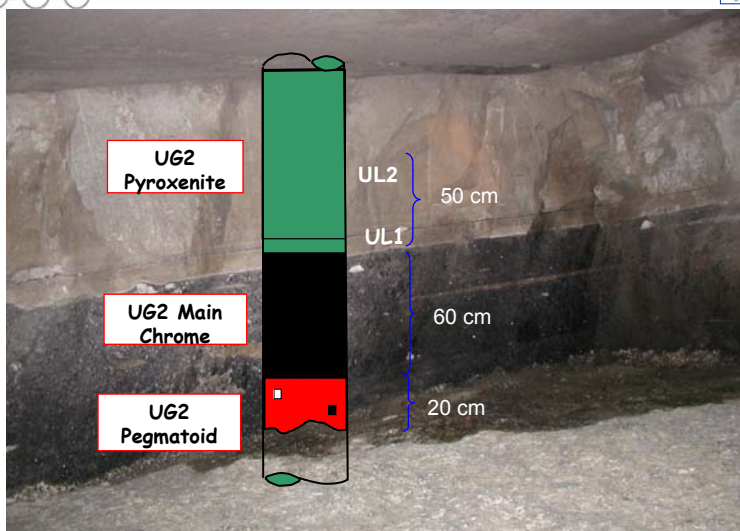
## Dip variation plan



- Depicts structural interpretation
- Dip steeper in shallow/slump area
- Ave 13 degrees
- Detailed variability influenced by borehole density
- Variability expected in "clean areas"

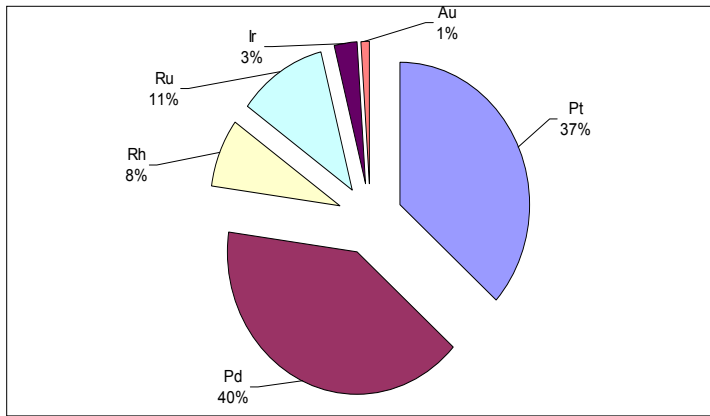
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## UG2 horizon



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## Marula UG2 - PGE splits



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## Reserves and resources



- Mineral Reserve :

|     |         |
|-----|---------|
| UG2 | 41.3 Mt |
|-----|---------|
- Mineral Resource:

|                  |         |
|------------------|---------|
| Merensky and UG2 | 66.6 Mt |
|------------------|---------|
- Phase 1 UG2 Reef  
(Merensky mined at a later stage)
- Evaluation drilling continuing on Merensky

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# MINING

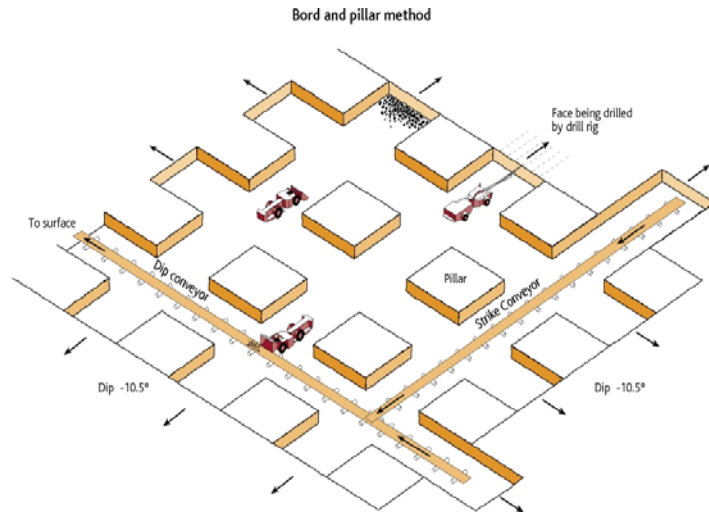
## Mine plan - phase one



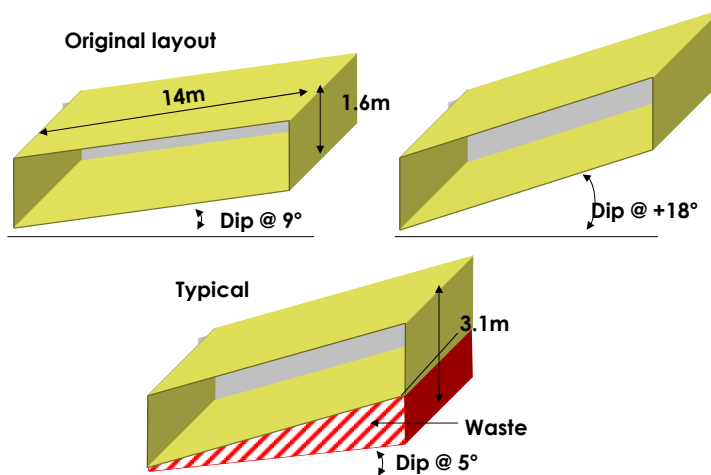
- Original mining based on trackless Bord and Pillar
- Two decline accesses
  - Clapham
  - Driekop
- Mine UG2 to a depth of 600 metres
- 233 000 ROM tonnes per month (103 000 oz Pt per annum)
- Infrastructure designed on a modular basis to facilitate future expansion
- Life-of-mine of 22 years



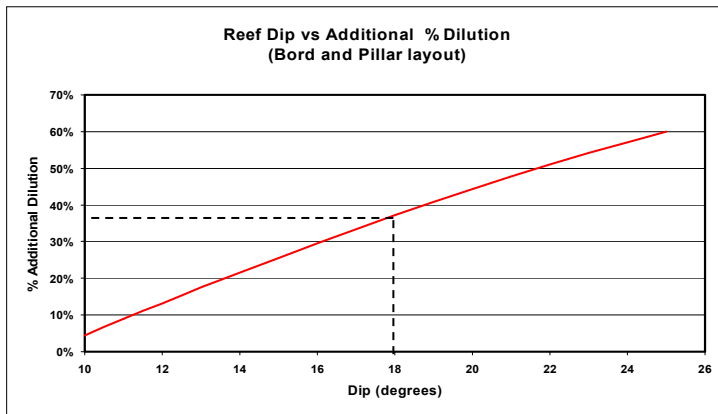
# Typical bord-and-pillar method



# Stope layout



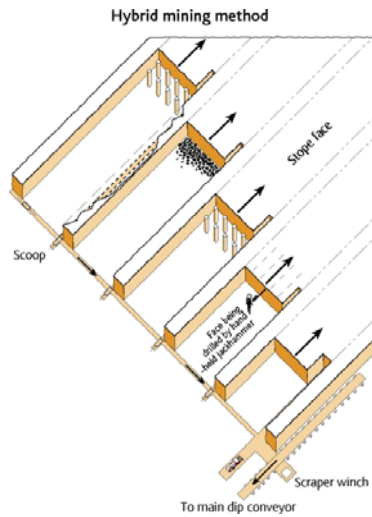
## Effect of reef dip on dilution



## Revised mine plan

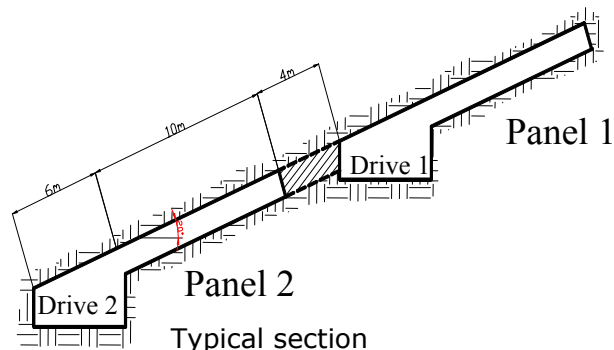
- Dips
- High dilution
- Poor equipment efficiencies
- Poor extraction rates at depth
  - 65% at 500m
  - 50% with geological losses
- Low-resource utilization
- High cost per ounce
- Long ounce buildup profile

## Semi-mechanised layout



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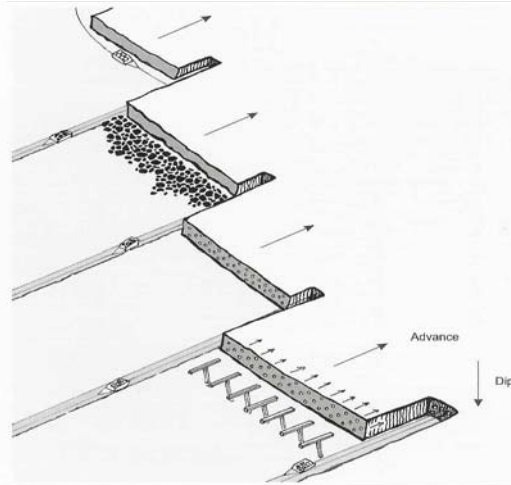
## Semi-mechanised layout



Typical section showing Trackless drive with conventional panel

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## Breast mining layout



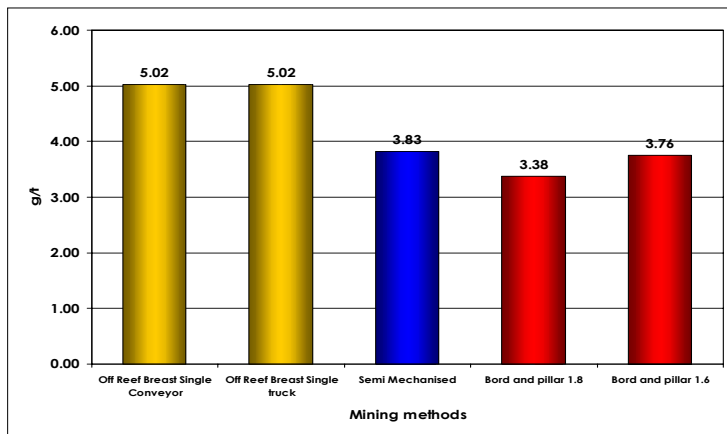
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## Mining methods evaluated

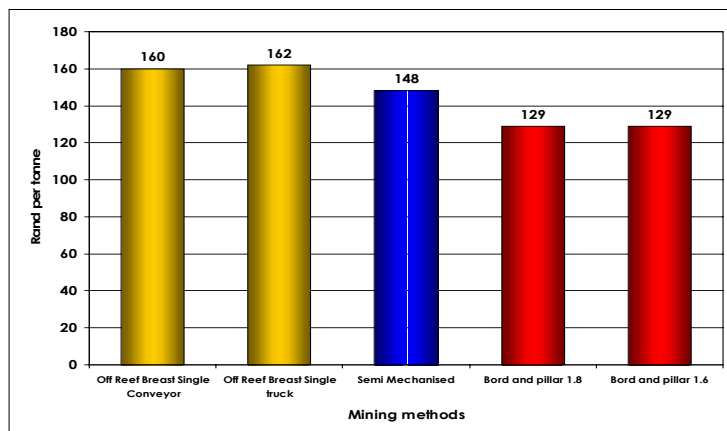
- Bord and pillar (1.6 or 1.8m)
- Semi-mechanised (3 or 2 shifts)
- On Reef Breast
- On Reef Dip
- Off Reef Breast (conveyors or trucks)
- Off Reef Dip(conveyors or trucks)

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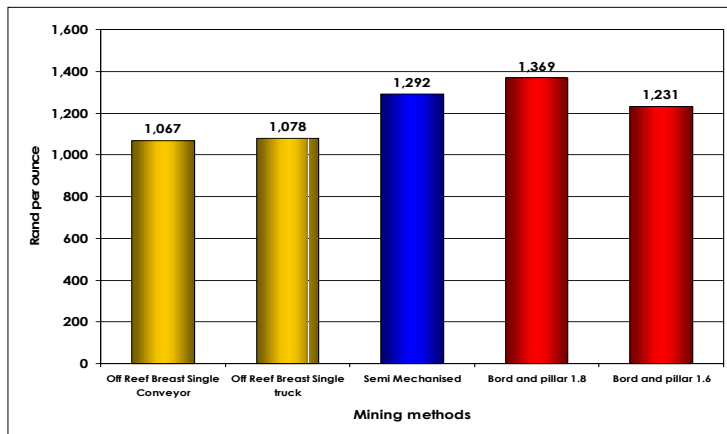
## Grade comparison



## Cost per tonne comparison



## Cost per ounce comparison



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## Mining method selected - conclusion



- Conventional breast stoping method chosen for the Life Of Mine Plan
- Footwall infrastructure and development
- Conventional stoping and strike development to be done in house
- Main development outsourced

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## The way forward



- Transitional phase to full production
- Detailed design work in progress
- Initiated footwall development
- EPCM contract to manage process
- Maintain ounce profile from current workings
- Maximise semi-mechanised operations
- Opportunities for breast mining on-reef

## Best practice



- Use of DDT drill jigs for stope and ASG drilling
- Support drilling with Auto drill
- Support with hydrabolts on face and pre-stressed stick support

## DDT drill jigs - objectives



- To reduce the physical effort
- Improved safety through face support in the form of roof-bolts
- Improving the quality of drilling
- Improving the face advance
- Improved hanging wall control

## Support drilling in-stope





## Hydrabolt



## Installed hydrabolt support



## Pre-stressed stick support



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## Production output

- Panel length 24,0m
- Face advance 22,0m
- Square meters/panel 528 m<sup>2</sup>
- Labour required 11
  - RDO 4
  - Winch operator 2
  - TBR/support 2
  - LHD 1
  - Miner assistant 1
  - PTV 1
- Efficiency 48 m<sup>2</sup>/man

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# MINERAL PROCESSING

## Mineral processing overview



- Design based on Mintek test work data
- Overall metallurgical recovery set at 82% of ROM grades (after mine call factor and scalping)
- Designed on a modular basis to facilitate future expansion
- Final concentrate transported to Mineral Processes

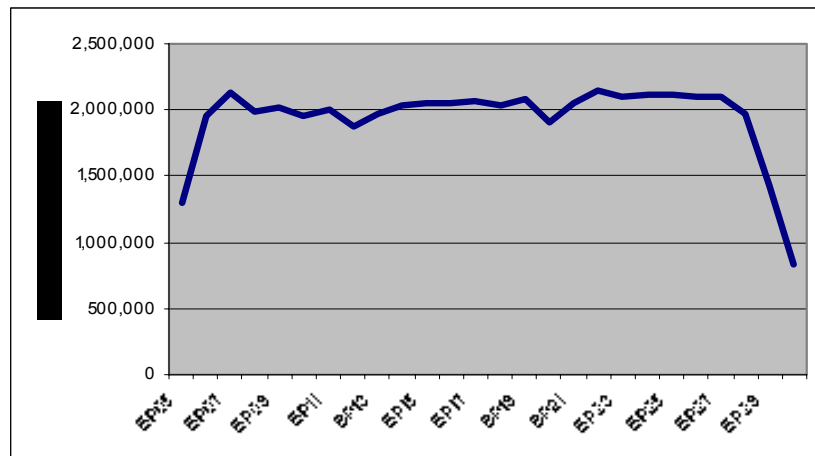
## Commissioning dates



- Plant commissioned March 2004
- Plant operating as per design expectations
- Completed on time and below budget
- DMS plant by-passed

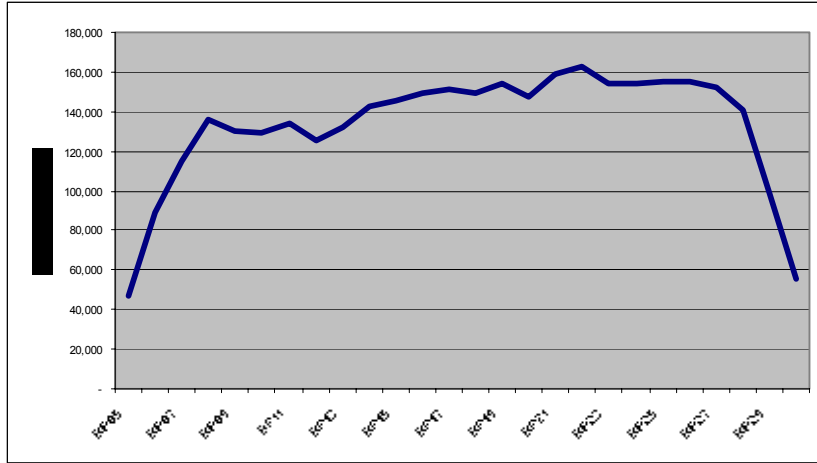
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## Tonnage profile

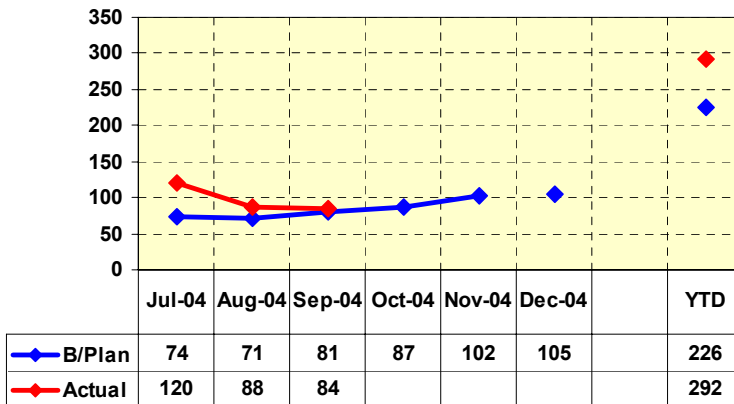


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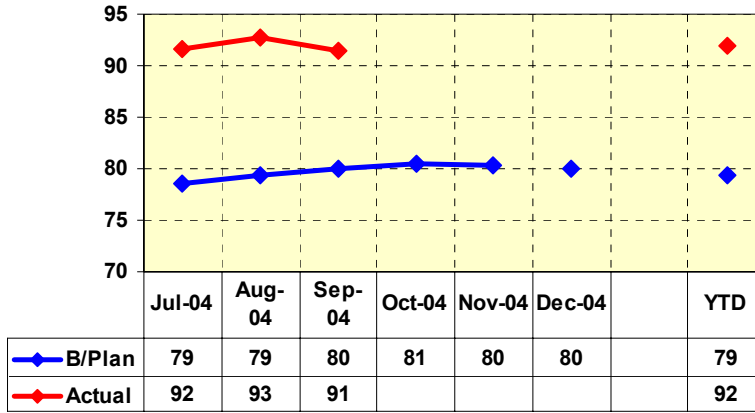
# Ounces profile



# Tonnes milled

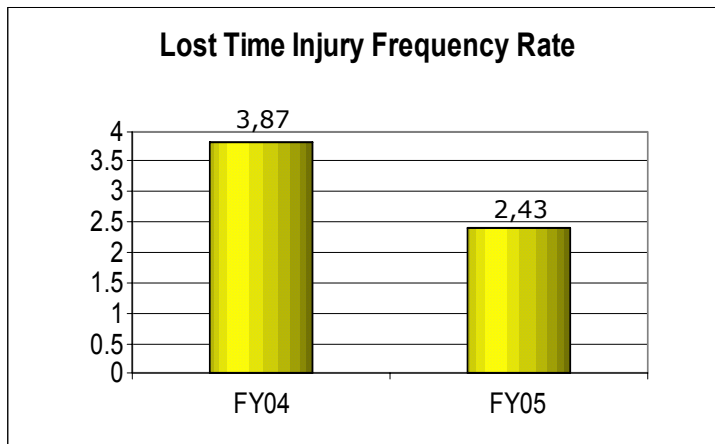


## PGM % recovery



# SAFETY

## Safety statistics



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## Safety initiatives



- 5 Platinum rules established
- Implemented the Meerkat system
- Training Centre underground to train workers in working environment
- Road safety awareness through propoganda and photographs
- Revised support methods
- Fall of ground campaign '*DROP THAT ROCK BEFORE IT DROPS YOU*'

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# ENVIRONMENT

## Environment



- Water permit application submitted
- Sewerage plant in full operation
- Water treatment plant in full operation
- Slimes dam operational
- Water Management Committee established
- Ground water monitoring with SRK





# INFRASTRUCTURE

## Infrastructure



- Bulk water supply
- Power supply
- Bio-filter sewage treatment works
- Central offices, workshops, ablutions, training facilities and clinic
- Offices, change house and lamp room at each shaft

## Lebalelo raw water dam



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## Eskom power



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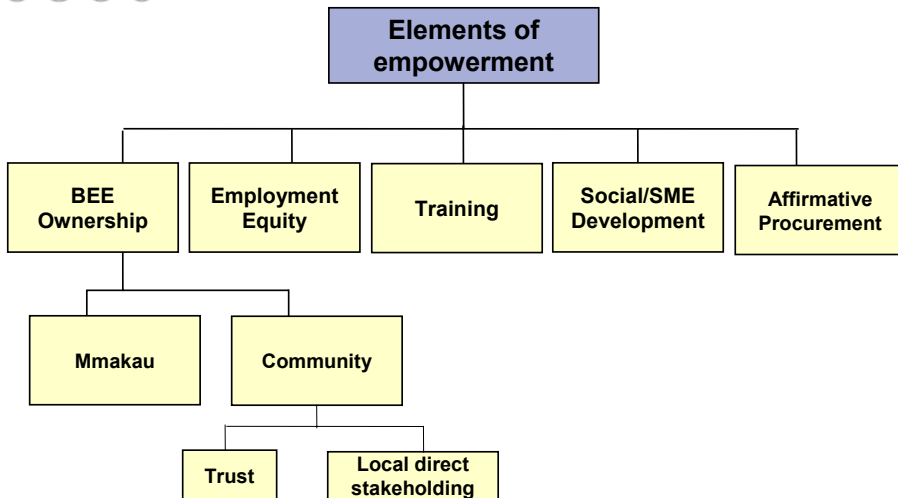


# SOCIAL INVOLVEMENT

## Hlahlana primary school



## Empowerment model



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## Marula Community trust



- Trust formed 5 August 2004 after 14 months of negotiations with all stakeholders
- R1m cheque presented by Impala to the Marula Community Trust
- 11 Trustees have been appointed to represent the relevant stakeholders

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## Employment



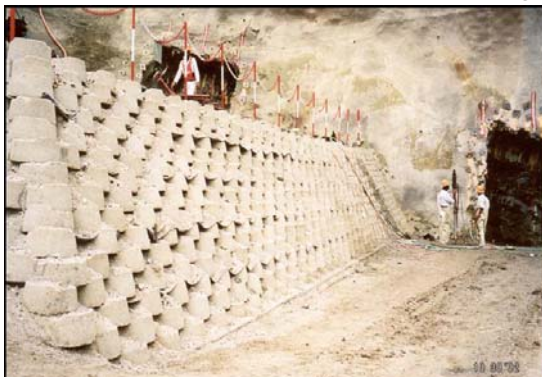
- 50.4% of workforce currently made up of local labour
- Committed to the Mining Charter, Social and Labour Plan and Implats' submission on Employment Equity Act
- 10 local miners trained and achieved blasting certificates
- 13 local apprentices qualified
- 4 local bursary students currently at university

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## Training



- Transfer of skills to the local community
- Skills training includes
  - Construction
  - Mining
  - Engineering



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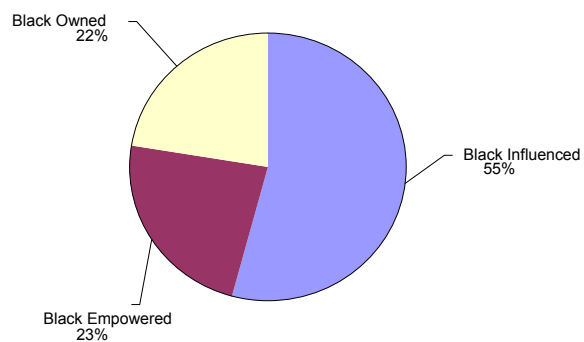
## Social involvement



- Preference to local contractors and suppliers
  - Building trades
  - Security
  - Fencing
  - Catering
  - Transport

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## Mining Charter Categories - procurement



R49m 1 July 03 – 30 June04

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# THANK YOU

