

# *“Our Marula Our Success”*



## **Analysts' Visit**

04 September 2007



## **Agenda**



- Welcome and introduction
- Marula overview
- Merensky project
  
- Concentrator presentation
- Plant visit
- Departure

**Les Paton**  
**Pieter Sandilands**  
**Vernon Anfield**  
**Val Coetzee**  
**Lucas Ngobeni**  
**Lucas Ngobeni**



## Overview of FY2007

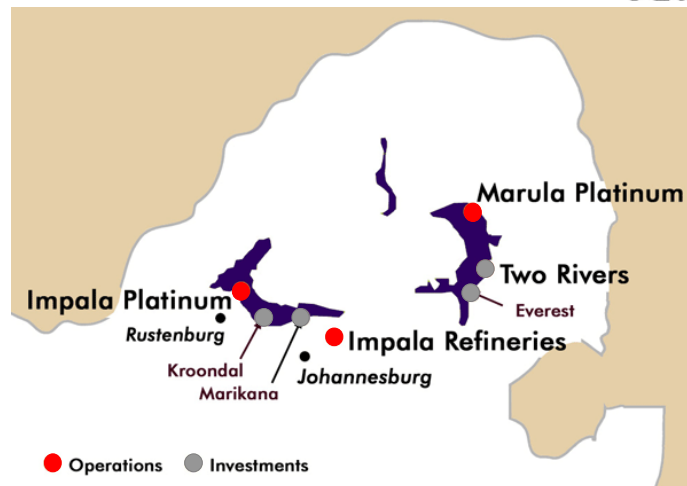


- Improved safety performance
- Tonnes milled up 49% and platinum production up 63% to 65,200 ounces
- 6E Grade at 4.09g/t
- Recoveries increased to 88.5%
- Unit costs decline as production builds up
- Net profit was 173% above budget
- Healthy margin of 46%
- Conversion to conventional mining on schedule
- Feasibility study on Merensky Reef project under way



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## Location



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## The owners of Marula



Owner	%	Role
Implats	77.5	Technical, managerial, financial and operational expertise
Mmakau Mining	7.5	An established mining entity
Marula Community Trust	7.5	Enables sustainable benefit to flow to community over life of mine and beyond
Tubatse Platinum	7.5	A broad-based HDSA empowerment consortium from local business



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## Vision 2010

***“Marula will be the  
Benchmark  
in the Eastern Bushveld  
Complex”***

## Values

- Mutual Trust
- Mutual Respect
- Treating Others With Dignity
- Open and Honest Communication
- Team Unity
- Quality Focus



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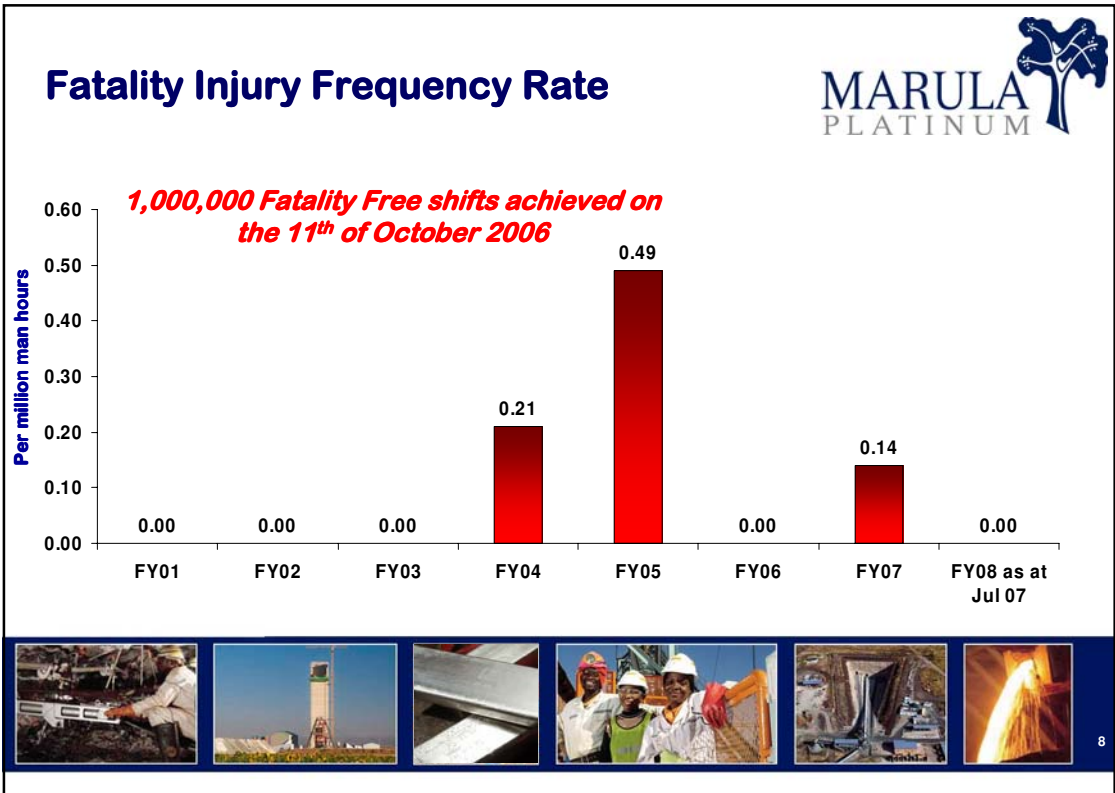


# Safety

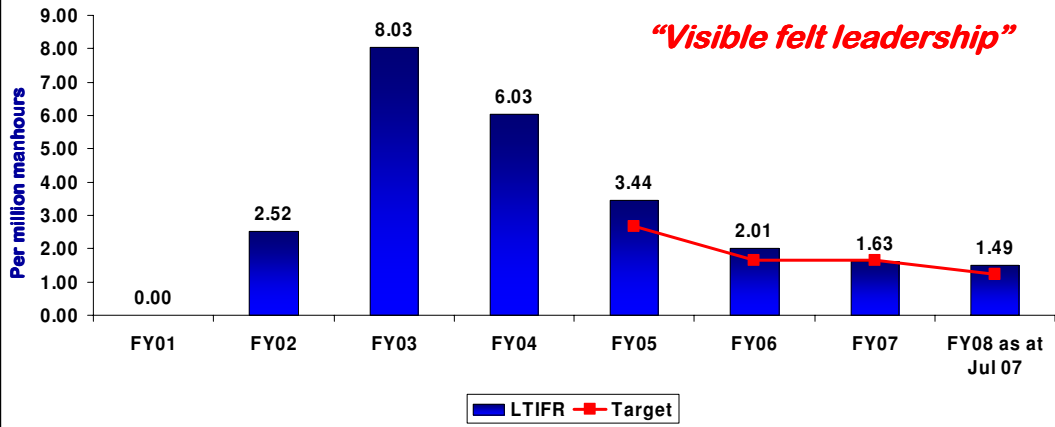






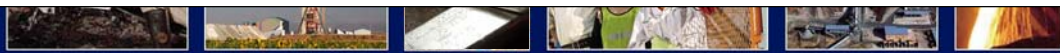
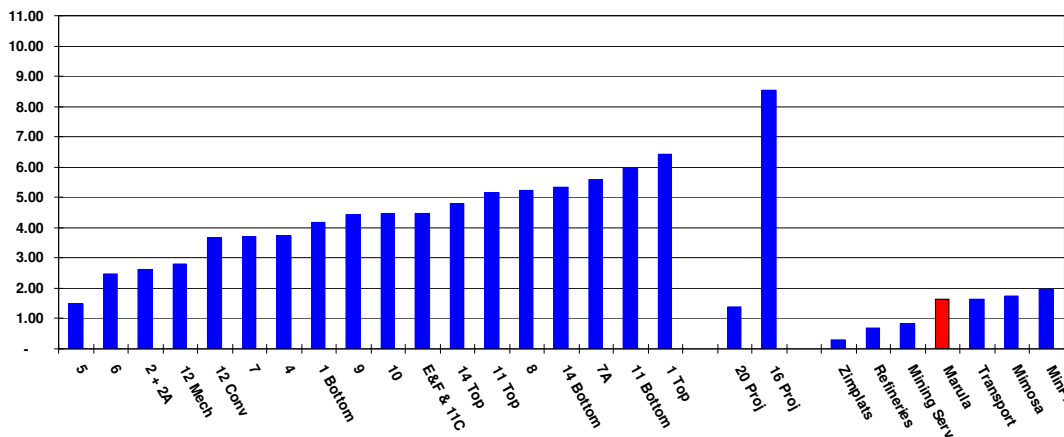
# Lost Time Injury Frequency Rate



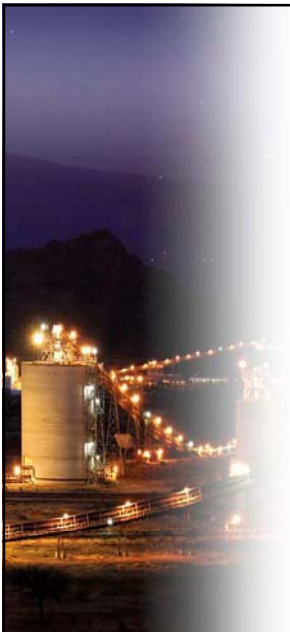
# FY07



## IMPALA PLATINUM HOLDINGS LIMITED (IMPLATS) - INDIVIDUAL UNITS LOST TIME INJURY FREQUENCY RATE 2007







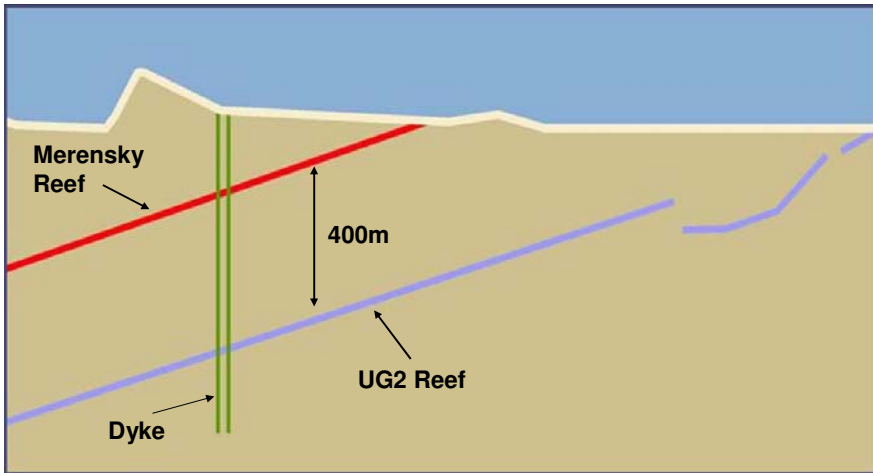


**MARULA**  
PLATINUM

**Geology**



**Generalised Section of Geology**





Merensky Reef

400m

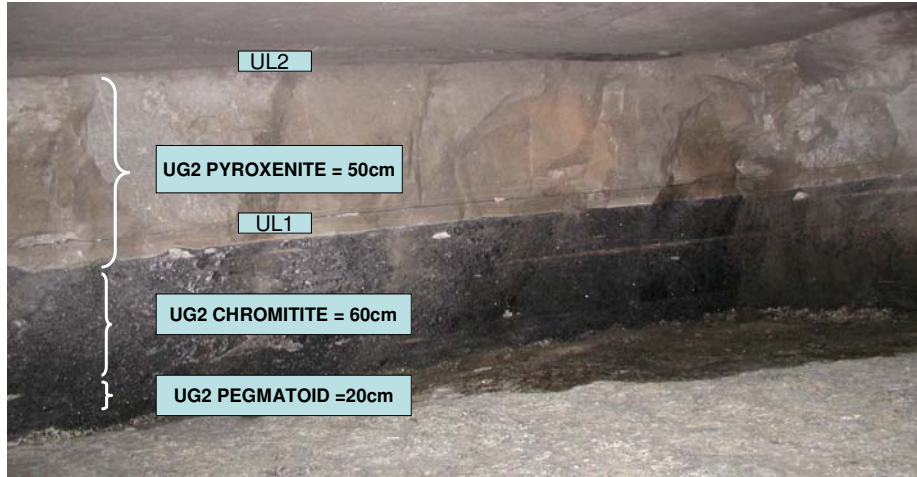
UG2 Reef

Dyke



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## UG2 Chromitite Layer



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## Reserves and Resources



*Mineral Reserves* as at 30 June 2007

Orebody	Category	Tonnage (millions)	Grade 6E(g/t)	Pt oz (millions)
UG2	Probable	39.5	5.2	2.5

*Mineral Resources (exclusive of Reserves)* as at 30 June 2007

Orebody	Category	Tonnage (millions)	Grade 6E(g/t)	Pt oz (millions)
Merensky	Indicated	50.2	5.47	4.7
	Inferred	5.2	5.73	0.5
UG2	Indicated	22.0	9.80	2.6
	Inferred	3.5	8.88	0.4
<b>Total</b>		<b>80.9</b>	<b>6.82</b>	<b>8.2</b>

*Metal Splits* as at 30 June 2007

	Pt%	Pd%	Rh%	Ru%	Ir%	Au%
UG2	37.10	38.03	8.31	12.12	3.41	1.03
Merensky	53.80	30.40	2.60	5.50	0.90	6.80




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## Interim Mining



### Why Interim Mining?



- Sustain a production build-up profile at 130 000 ROM t/month
- Improved short term project viability when compared to the original bord and pillar design
- Development of personnel in conventional mining skills



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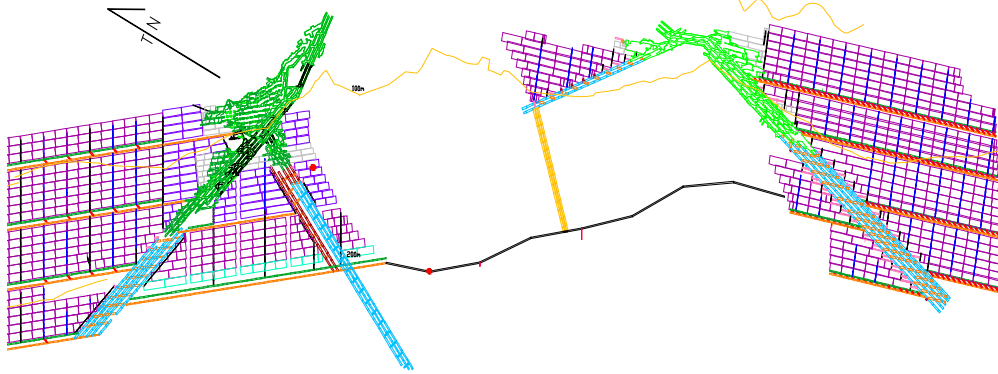


# Interim Mining Layout



CLAPHAM SHAFT -

DRIEKOP SHAFT



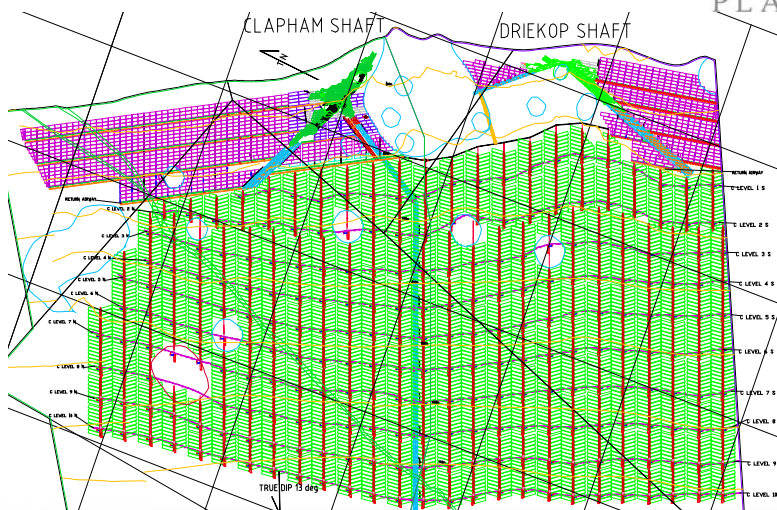
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# Conventional Mining Layout



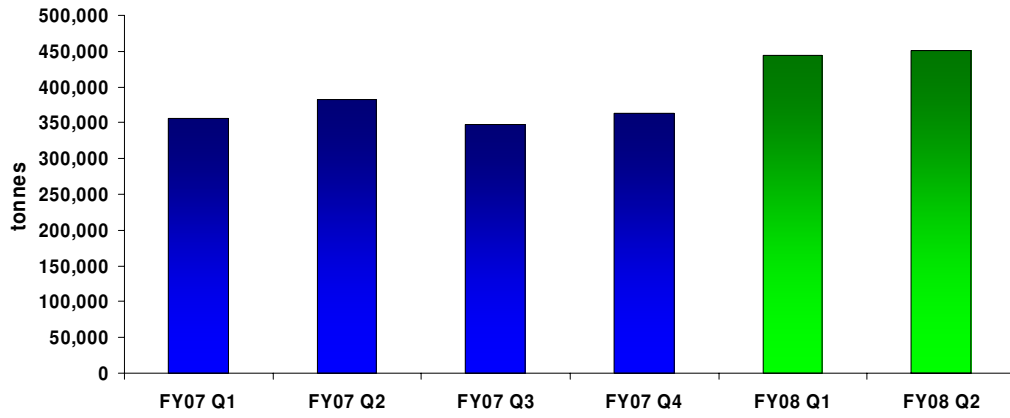
CLAPHAM SHAFT

DRIEKOP SHAFT



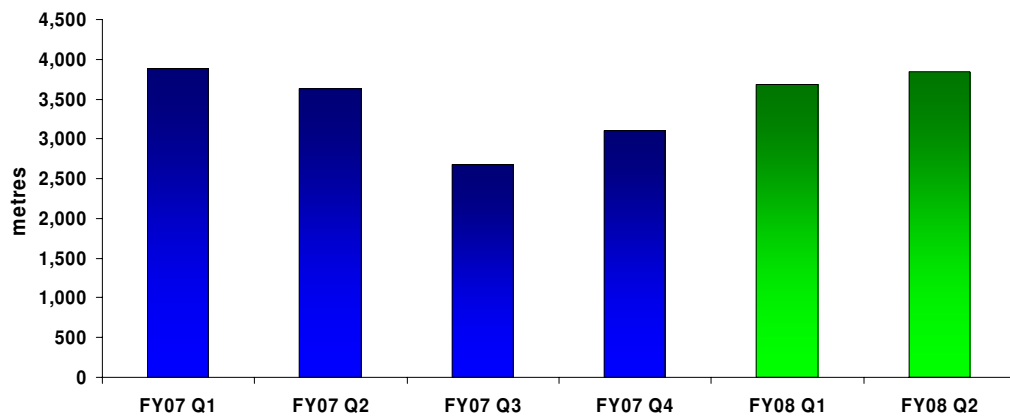
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## Interim Mining - tonnes milled



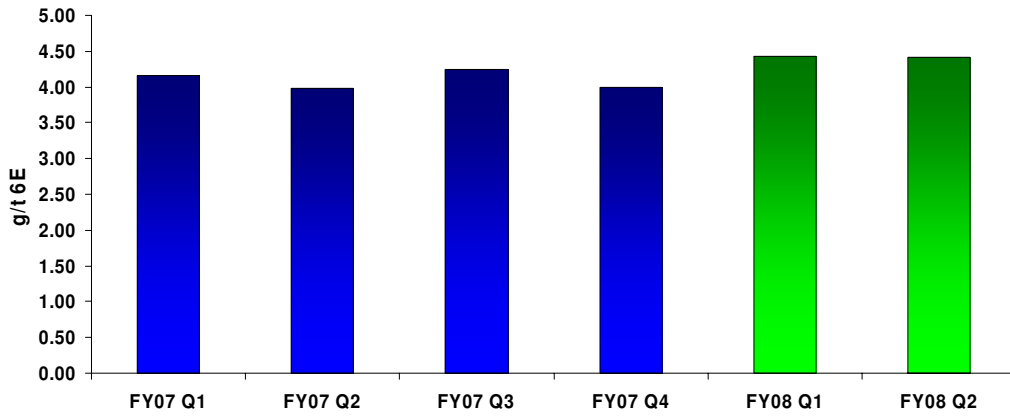
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## Interim Mining - development metres



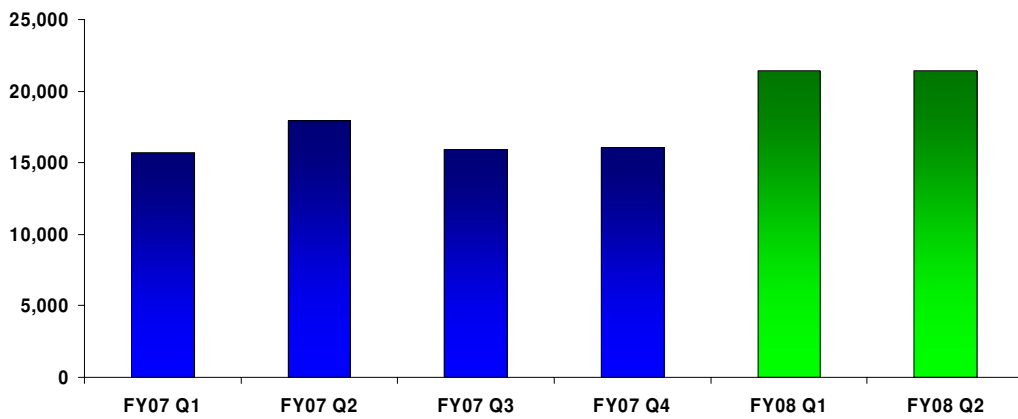
20

## Mill Feed Grade 6E



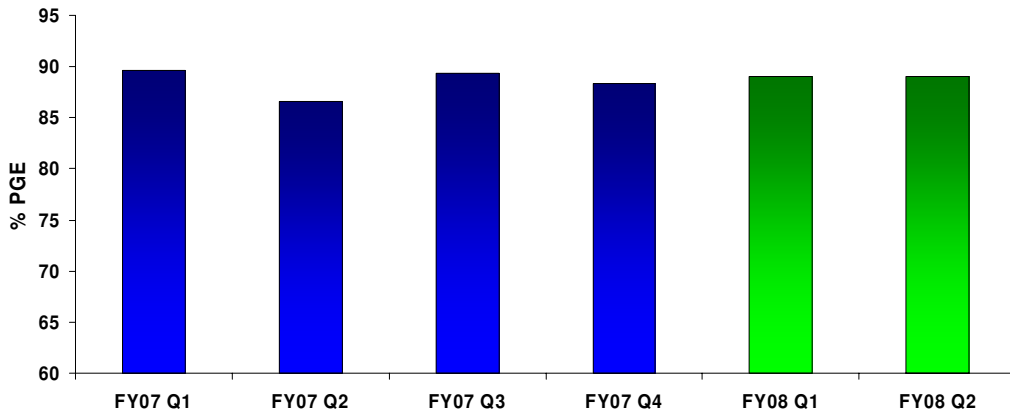
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## Interim Mining Platinum ounces in concentrate



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## % PGE Recovery

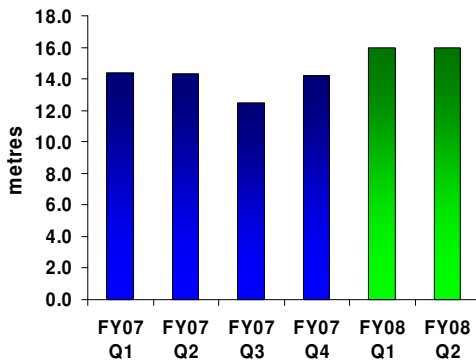


23

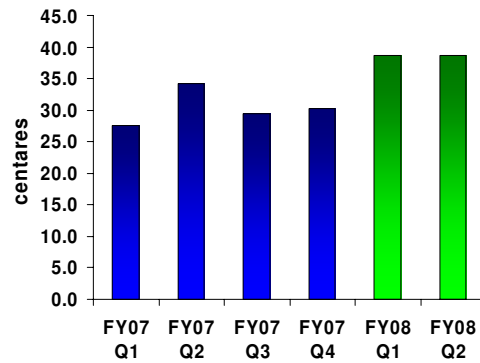
## Interim Mining - stoping efficiencies



Average Face Advance Metres



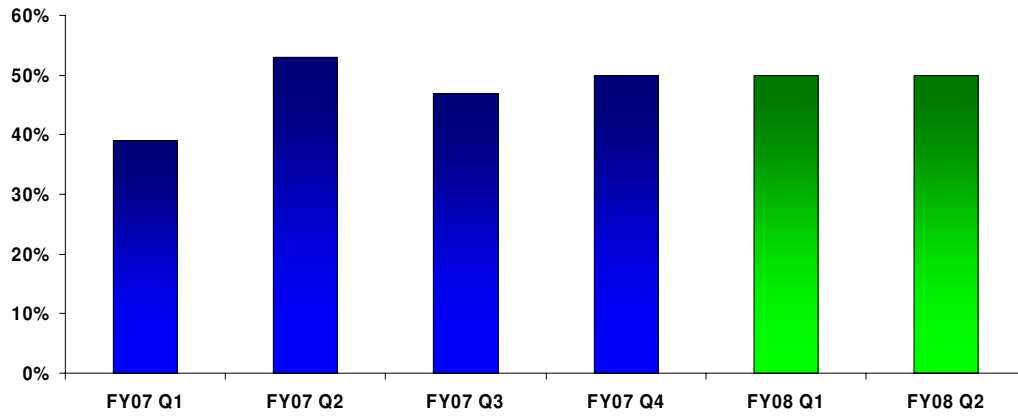
Centares per Panel Employee



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## Gross Margin %



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## Performance Indicators FY07 vs FY06



		Actual	Actual	Variance	
		FY2007	FY2006		%
Tonnes milled	(000t)	1 450	972	478	49
Centares	(m <sup>2</sup> )	169 724	109 728	59 996	55
Dev. Metres (operations)	(m)	13 299	10 393	3 068	28
Mill feed grade 6E	(g/t)	4.09	3.92	0.17	4
PGE kilograms in conc.	(kg)	5 330	3 229	2 101	65
Platinum ounces in conc.	(000oz)	65.2	40.0	25.2	63
<b>Unit Cost</b>					
Cost/tonne milled	(R/t)	383	389	6	2
Cost/PGE kg in conc	(R/kg)	104 165	117 219	13 054	11
Cost/Pt oz in conc	(R/oz)	8 515	9 463	948	10



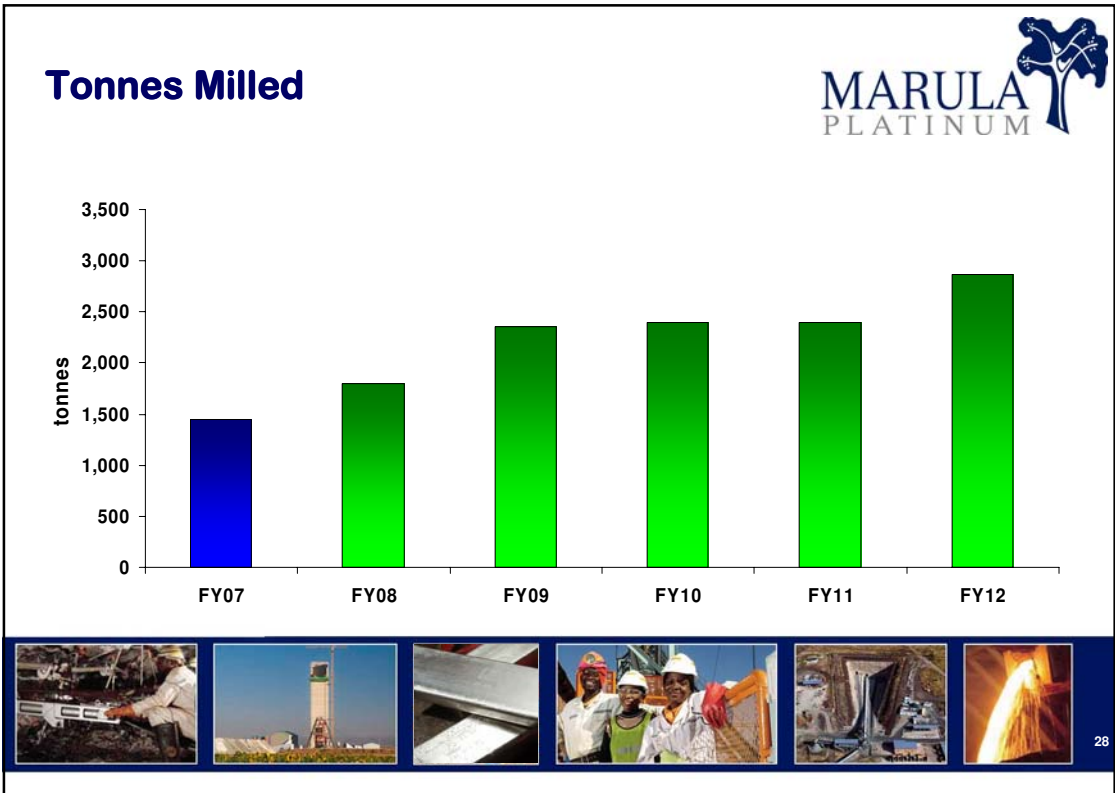
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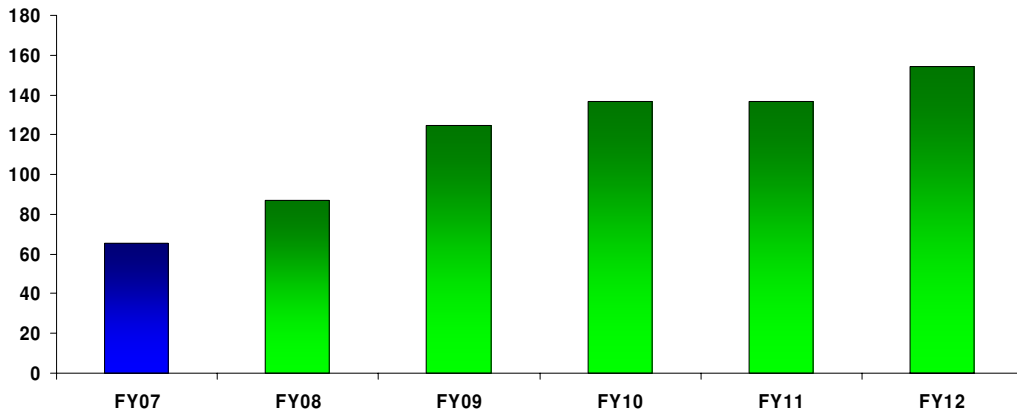


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**Marula – the way forward**

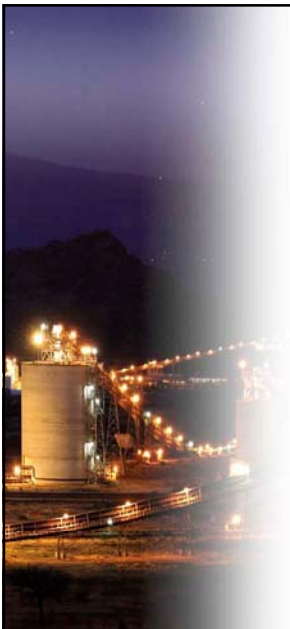
## Platinum Ounces in Concentrate



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## New Technology



## DDT at Marula



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## DDT Implementation Progress



- Implementation started FY06.
- The planned target is 70% of all panels mined
- Currently 60% of all panels are converted
- Roofbolt compliance 65% of all panels
- Acceptance by drill operators and supervisors positive

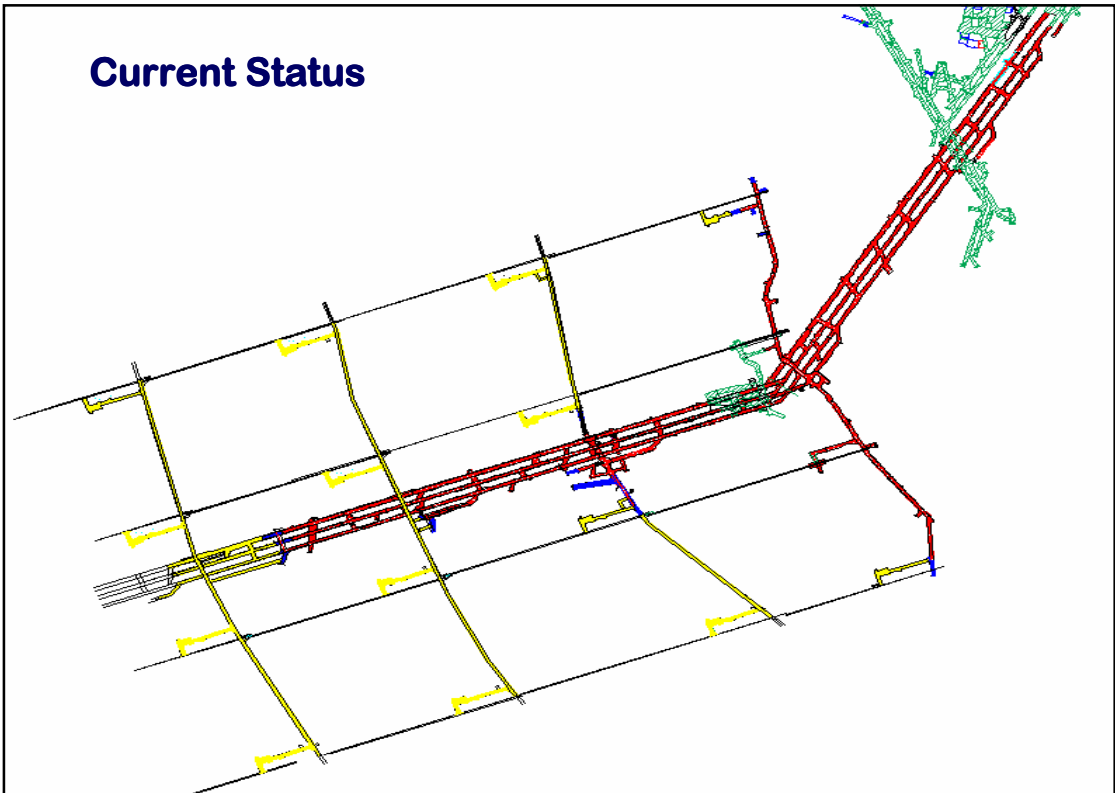


32

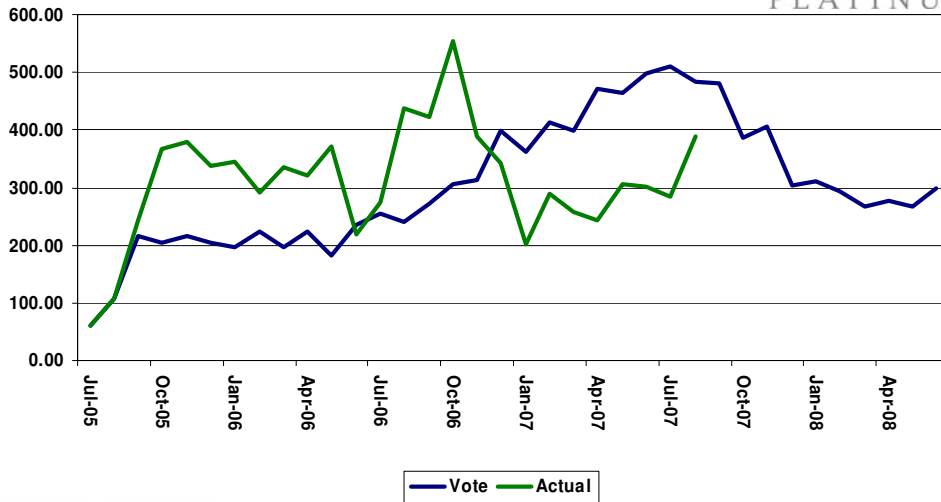


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**Footwall Conversion Project –  
Conventional Mining**



## CBE Production Metres Project to Date



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## Footwall Project



- **Production:**
  - The declines is on 80 metres from the shaft bottom. The expected completion date is November 2007
  - Level 1 is developed to the capital limit.
  - Level 2 drive is in progress and has reached the first raise positions on both the north and south side.
  - Level 3 station X-cut is complete and the station development has commenced.
  - Level 4 station X-cut is in progress and are currently 15m from the level position.



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## Footwall Project



- **Construction**
  - Installation of the chairlift up to Level 1 is in progress and will be completed in August 2007
  - Work has commenced on the installation of the Level 2 Silos
- **Cost as at end of June 2007**

• Vote	R830.6 million
• Spend	(R571.2 million)
• Forecast	(R259.4 million)
• Projected saving	nil



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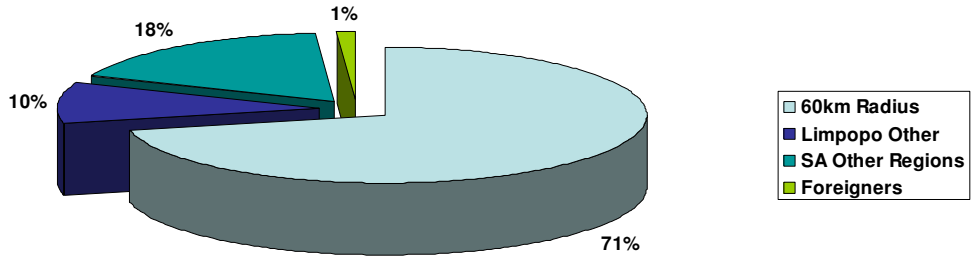


## SLP



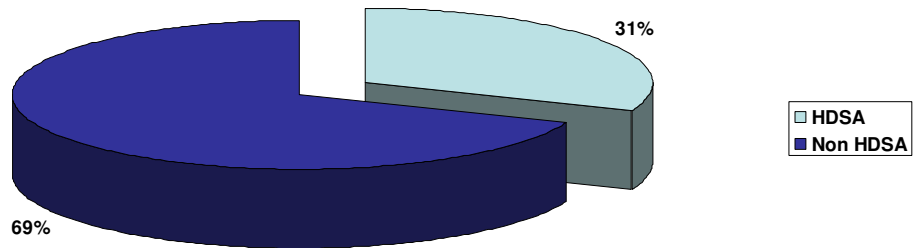
This slide features a large nighttime photograph on the left side, showing a large industrial structure, likely a silo, illuminated by a series of lights that create a long, glowing path. The rest of the slide is white, with the Marula Platinum logo in the upper right and the text "SLP" centered. At the bottom, there is a horizontal strip of six small images, identical to the one on slide 37.

## Labour Sending Areas



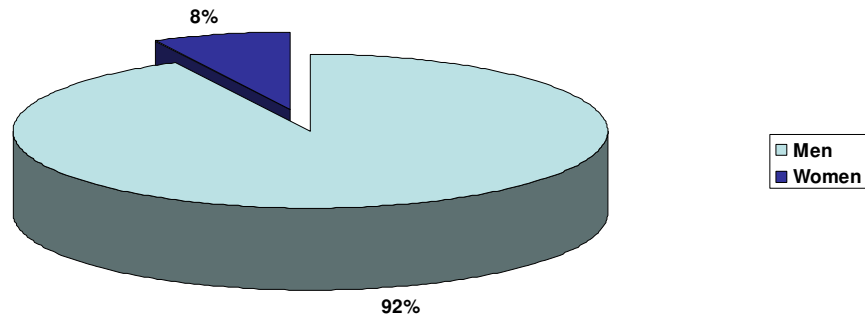
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## HDSAs in Management



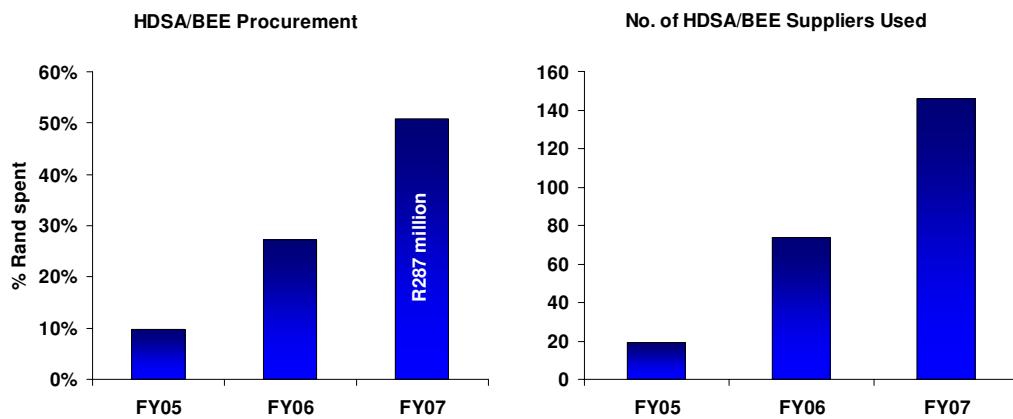
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## Women in Mining



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## Preferential Procurement



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## Social Issues








## Stakeholders









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Tswako Mohlala Traditional Community (2)  
 Roka Mashishi Traditional Community  
 Manyaka Traditional Community (2)  
 Kgoete Traditional Community  
 Magabaneng-Independent Community

DME  
 Limpopo Provincial Government  
 Greater Tubatse Municipal Council

Republic of South Africa:  
 Owner of surface and minerals  
 Winnaarshoek 250 KT  
 Clapham 118 KT  
 Forrest Hill 117 KT  
 Driekop 254 KT  
 Hackney 116 KT

Impala Platinum Holdings Limited.	Marula Communit y Trust.	Tubatse Platinum (Pty) Ltd.	Mmakau Mining (Pty) Ltd.	2 000 employees
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## Community issues



- Chrome
- Employment
- Land Rental
- CSI Project - Water to schools
- Community Hall
- Empowerment of shaft vendors



## Local and District Government Involvement



- Member of the Steelpoort Valley Producers Forum
- Projects:
  - Integrated public transport
  - Spatial Development
  - Waste Management
  - Establishment of PMU in GTM
  - Training and development of GTM managers and junior staff
  - LED Projects approved by Marula, GTM and DME
    - Supply of water and power to households within Ward 8 and 10 on the four farms





## Local and District Government Involvement (Cont)



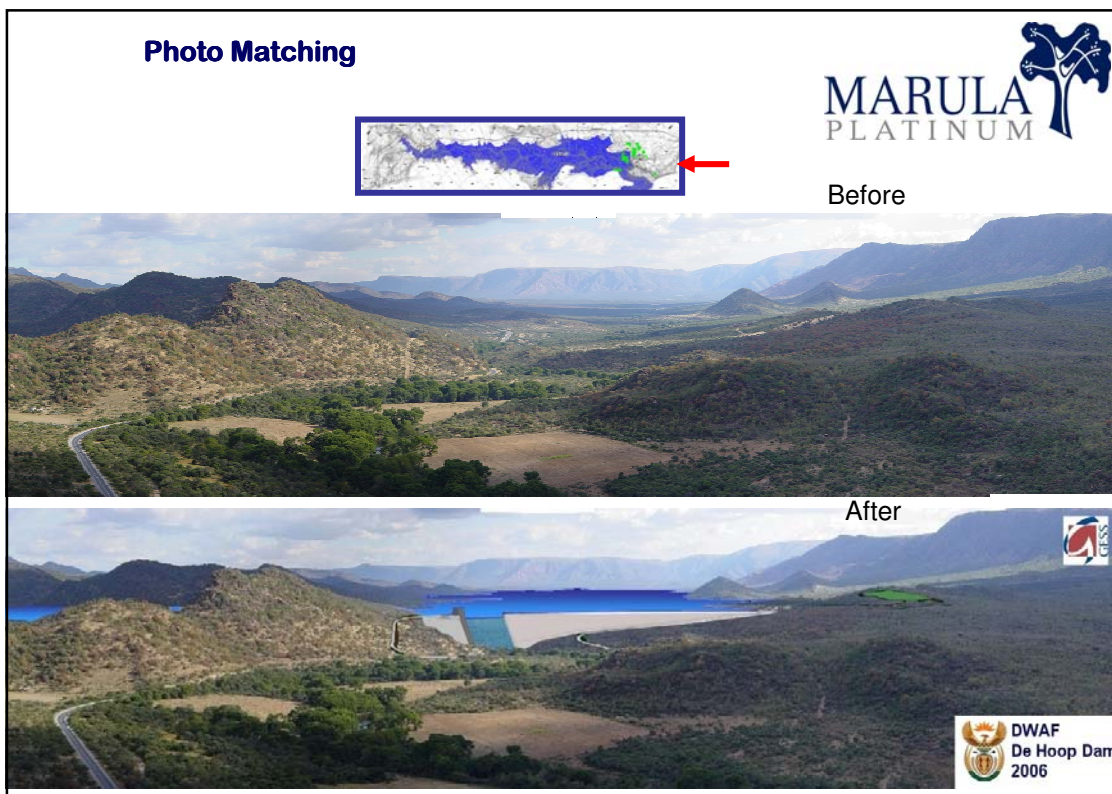
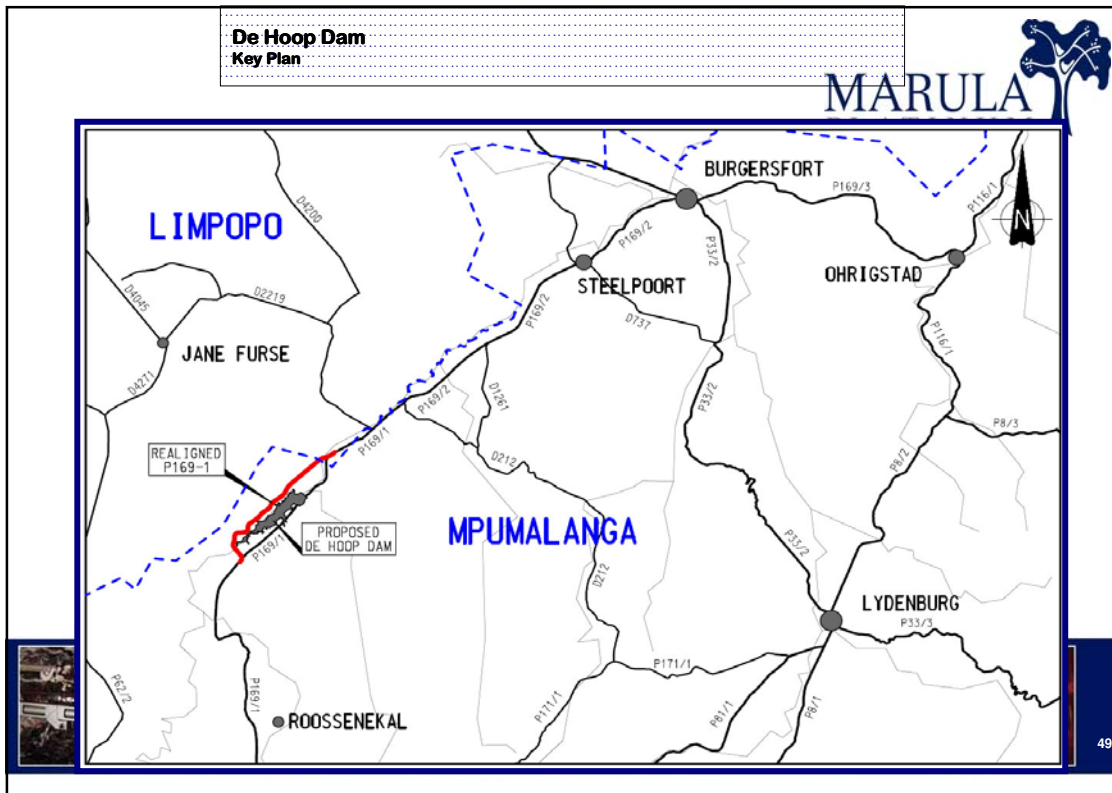
- Member of Joint Water Form (JWF)
- Member of Lebalelo Water Users Association
- Future water distribution:
  - De Hoop Dam Project (DWAF)

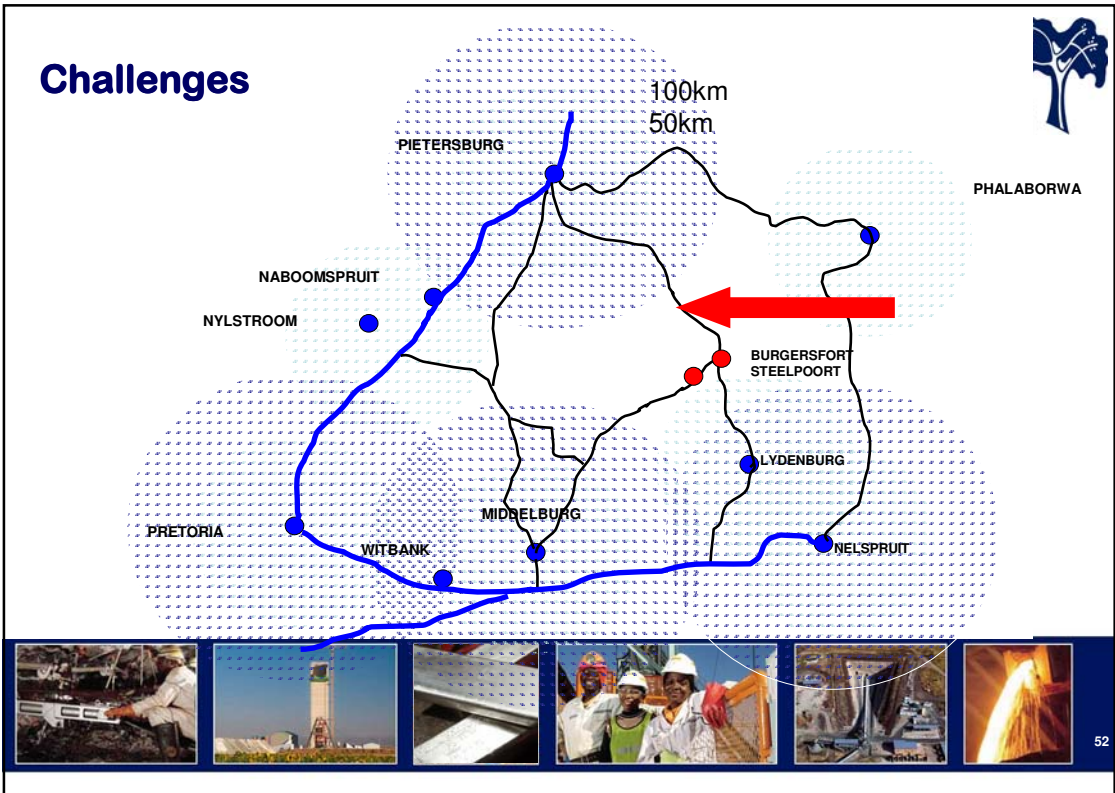
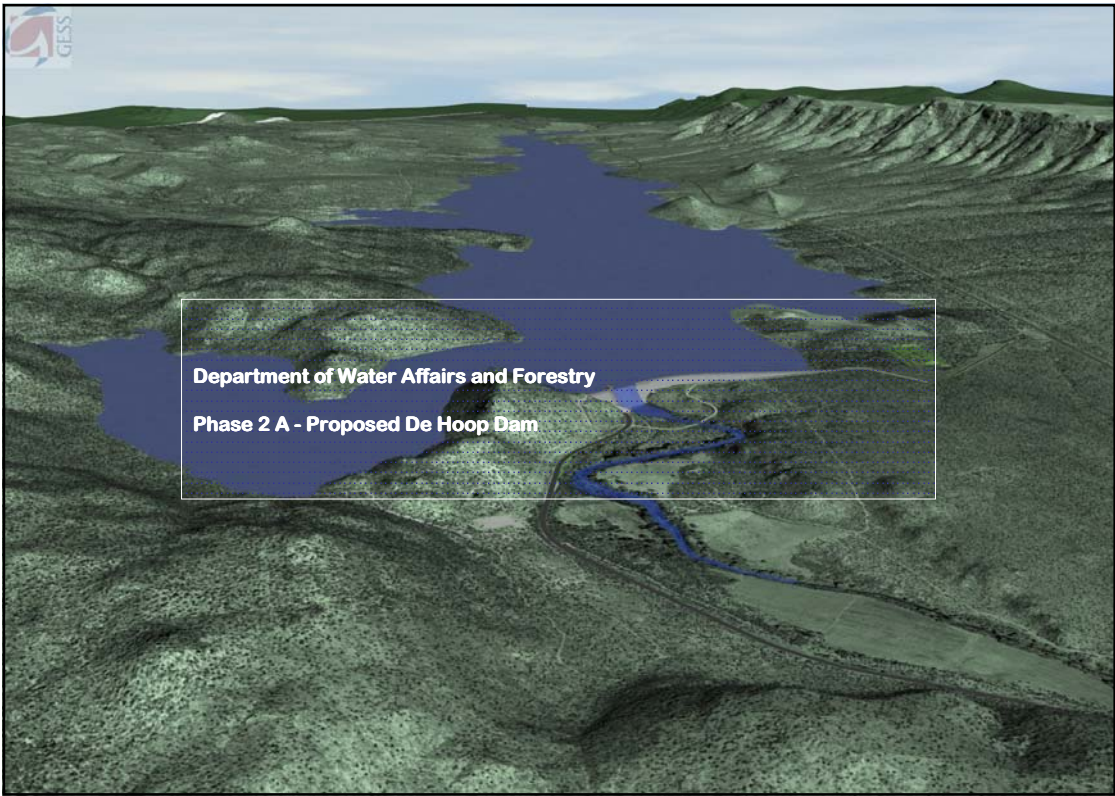


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## OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT (ORWRDP)









## Challenges



- Mining flexibility x ✓
- Trackless equipment x ✓
  
- Skills retention x ✓
- Work ethics x
- Union leadership x
- Community relations x
  
- Mineral Rights Conversion x
  - Social and labour plan
  - Local economic development plan



## Concentrator Plant



## Mineral Processing



- Design based on Mintek test work data
- Ball milling selected
- Designed on a modular basis to facilitate future expansion
- Final concentrate transported to Mineral Processes in Rustenburg.
- Present metallurgical recovery at 89%



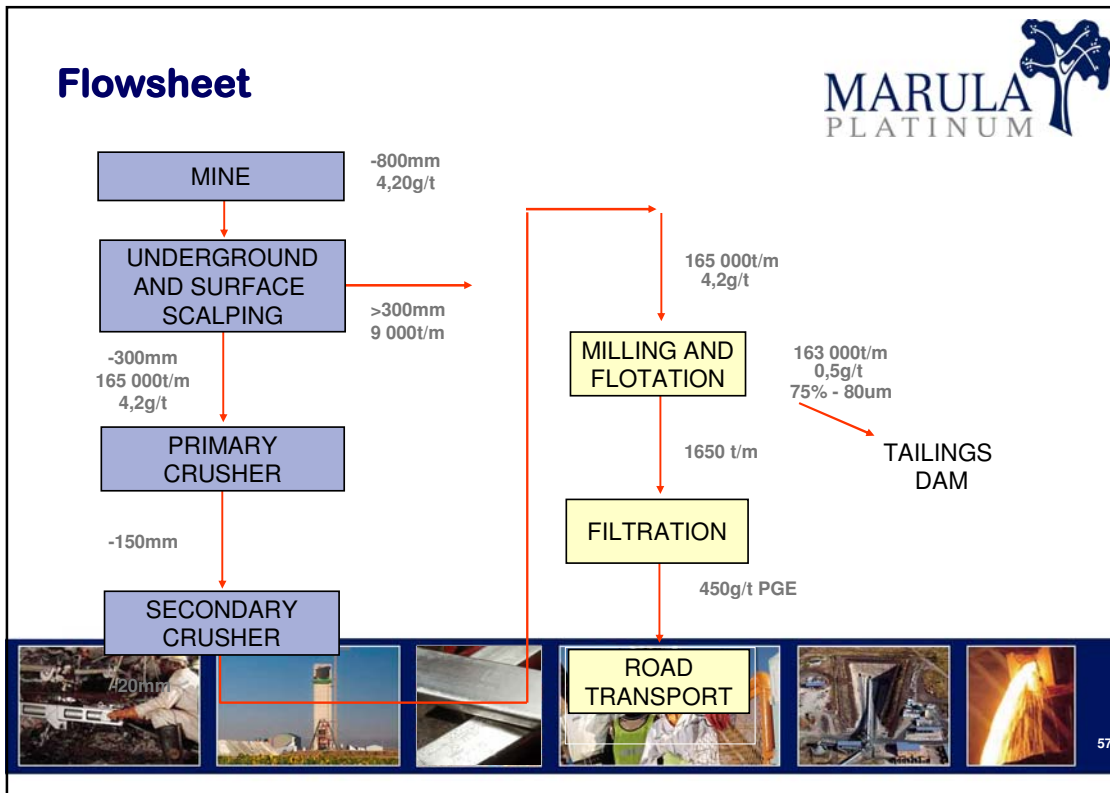
## Project Program




2002	July August September	Mining contractor appointment Plant construction started Mine development started
2003	May November	Stoping started Plant cold commissioning starts
2004	19 January 20 February	Plant hot commissioning started First concentrate shipped








## Safety Statistics

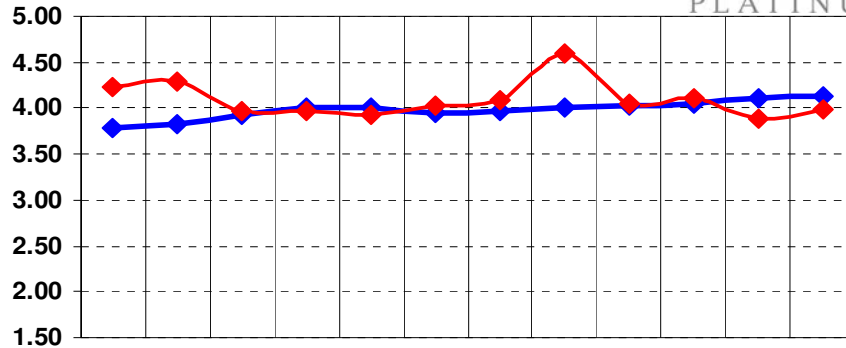


Description	Actual	Target
Lost Time Injury Frequency Rate (L.T.I.F.R.)	3.03	0
All Injury Free Days	35	365
Lost Time Injury Free Days	296	365
Reportable Injury Frequency Rate (RIFR)	0.00	0.00
Number of Injuries for the Month	0	0
Number of Incidents for the Month	31	30
Number of Meerkat, SHEQ Coaching & Ingwenyas	26	20



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## Mill Feed Grade - 6E

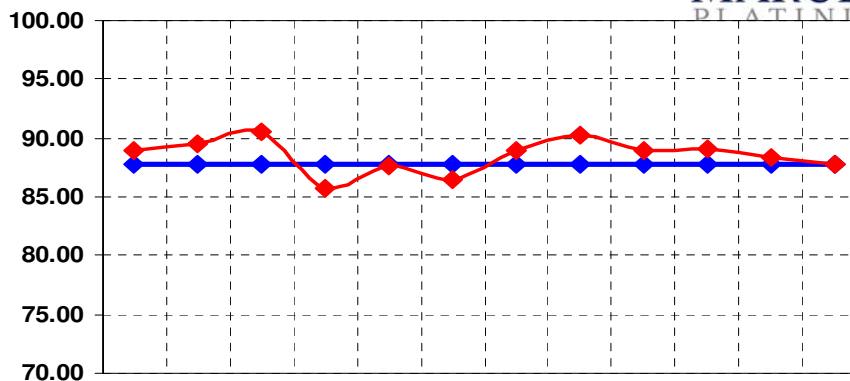


	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
B/Plan	3.79	3.82	3.92	4.01	4.01	3.95	3.98	4.01	4.04	4.04	4.12	4.12
Actual	4.22	4.29	3.98	3.97	3.93	4.03	4.09	4.59	4.06	4.11	3.90	3.99



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## PGE Recoveries

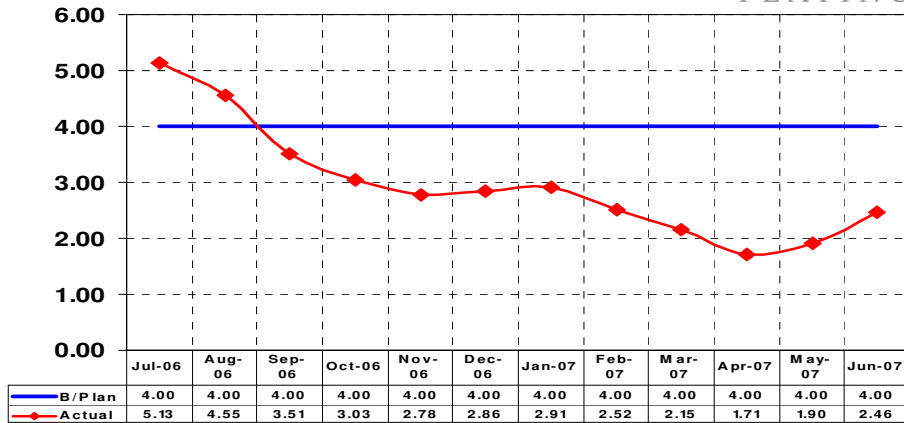


	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
B/Plan	87.80	87.80	87.80	87.80	87.80	87.80	87.80	87.80	87.80	87.80	87.80	87.80
Actual	88.88	89.47	90.53	85.77	87.57	86.50	88.95	90.19	88.88	89.03	88.41	87.74



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## Cr<sub>2</sub>O<sub>3</sub> % in Concentrate



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## Plant Evaluation and Optimization



- The work was initiated in May 2006
- The main objectives:
  - Determine process changes and capital expenditure required to enable treatment of 200 000tpm through the existing plant
  - Optimization of the metallurgical plant



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## Conclusions



Marula circuit will be able to treat a throughput of 200 000tpm with minimal upgrade changes required.

- Optimization of the cleaner circuit configuration in order to reduce chrome in concentrate and maximise final concentrate grades.
- Optimization of the Larox filter capacities.
- Confirmation of optimal reagent suite and addition points
- Characterisation of the effect of the rougher concentrate thickeners and attritioners on cleaner circuit performance.
- Characterization of cleaner feed systems including pumps and process controls.
- Circuit modifications – re-routing of miss matched streams.
- Optimization of grinding media alloy.



## Plant Complement



**Total** **114**

- Local 80%
- Women total 28%
- WIM 21%
- HDSA in management 29%







## Merensky Project



## Project Phases



- **Scoping study**
  - Understanding of the geology
  - Identify applicable mining methods and iterations
  - Include conceptual thoughts on life of Marula (20years+)
- **Pre-feasibility study**
  - Evaluate three mining options
  - Make recommendation on preferred option
- **Feasibility study**
  - Do detail design and CBE



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## Pre-feasibility study



- Scope of the study
  - Evaluate three mining options
  - Recommend the preferred option
  - Evaluate access options and placement of shafts
  - Develop a process circuit
  - Start the EMPR process
  - Identify long lead items



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## Pre-feasibility study



- Three stope designs were generated:
  - Convention mining layout (base case)
  - Hybrid mining layout (option 1)
  - Bord and Pillar layout (option 2)
- Certain items were kept common to each method:
  - Plant
  - Tailings dam
  - Surface infrastructure
  - Shaft



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## Pre-feasibility study



- Three production schedules generated
- Three methods put through the Impala Financial model
- Capital cost based on historical data and actual figures
- Working cost derived from actual figures and benchmarked with Impala and similar operations



## Pre-feasibility study



- Conclusion:
  - Conventional mining method most applicable to ore body
  - Decline system developed trackless
  - Trackless ore transport system on levels
  - Conveyor transport system in shaft (study)



## Metallurgical Background



- Metallurgical Test Work completed
  - Extensive laboratory scale drill-core test work
  - Extensive pilot plant test work ~ 200 ton bulk sample mined from the deposit
- Excellent recoveries achieved in a MF1 circuit
  - 90% (PGM + Au) recovery expected
  - Subject to ongoing grade optimisation test work



## Design Criteria



- Plant design aimed at minimising CAPEX & OPEX
  - CAPEX reduction - shared UG2 plant services and infrastructure already in place
  - E&I, water networks, workshops, reagents, tailings
  - OPEX reduction – shared operational management
  - Focus on layouts – stretch current UG2 staff
  - Economies of scale benefits

