

# OPERATIONS 2018 CONTINUED

## Phoenix (tailings retreatment)

		FY18	FY17	FY16
<b>Number of employees</b>				
– Permanent		87	82	82
– Contractors		252	261	296
Total		349	343	378
<b>Operational</b>				
Volumes milled	(000t) (metric)	5 962	6 729	6 465
	(000t) (imperial)	6 575	7 420	7 129
Gold produced	(kg)	737	918	804
	(oz)	23 695	29 515	25 849
Gold sold	(kg)	739	932	788
	(oz)	23 759	29 964	25 335
Grade	(g/t)	0.124	0.136	0.124
	(oz/t)	0.004	0.004	0.004
Productivity	(g/TEC)	183.88	187.96	177.72
<b>Financial</b>				
Revenue	(Rm)	397	512	429
	(US\$m)	31	38	30
Average gold price received	(R/kg)	537 547	549 777	544 390
	(US\$/oz)	1 301	1 258	1 168
Cash operating cost	(Rm)	326	364	320
	(US\$m)	25	27	22
Production profit	(Rm)	71	140	117
	(US\$m)	5	10	8
Capital expenditure	(Rm)	3	5	5
	(US\$m)	–	–	–
Cash operating cost	(R/kg)	442 526	396 486	398 122
	(US\$/oz)	1 071	907	854
All-in sustaining cost	(R/kg)	446 268	404 685	403 907
	(US\$/oz)	1 080	926	866
<b>Safety</b>				
Number of fatalities		0	0	0
Lost-time injury frequency rate per million hours worked		0	0	2.06
<b>Environment</b>				
Electricity consumption	(GWh)	41	42	40
Water consumption – primary activities	(ML)	260	249	267
Greenhouse gas emissions	(000t CO <sub>2</sub> e)	40	42	41
Intensity data per tonne treated				
– energy		0.007	0.006	0.006
– water		0.04	0.04	0.04
– greenhouse gas emissions		0.007	0.006	0.006
Number of reportable environmental incidents		0	0	0

## Phoenix (tailings retreatment) *continued*

### Other salient features

Status of operation	Retreatment of tailings
Life of mine	12 years

### Mineral reserves as at 30 June 2018

Reserves (metric)	Proved reserves			Probable reserves			Total mineral reserves		
	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)
	62.7	0.29	18	–	–	–	62.7	0.29	18
Reserves (imperial)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)
	69.1	0.008	575	–	–	–	69.1	0.008	575

Phoenix, a tailings retreatment operation situated in Virginia in the Free State Province, makes use of the Saaiplaas plant to retreat tailings. During FY13, Harmony finalised an empowerment agreement and transferred 30% of its shareholding in the Phoenix operations to black economic empowerment owners.

Phoenix's operational performance in FY18 was impacted by lower volumes processed and lower recoveries. Recovery grades are expected to improve in FY19.

Year-on-year, gold production decreased by 20% to 737kg (23 695oz), mainly as a result of a 9% decrease in the recovered grade to 0.124g/t (0.004oz/t), and an 11% reduction in volumes processed to 5 962 000 tonnes (6 575 000 tons).

The 2% decrease in the average rand gold price received and decrease in gold production, resulted in a 22% decrease in revenue to R397 million (decrease of 18% to US\$31 million). Cash operating costs decreased by 10% to R326 million (decreased by 7% to US\$25 million) due to the lower volumes processed in FY18.

Operational success depends on maintaining plant efficiency and reducing pump and pipe failures (adequate spillage control). Grade variability and the theft of pipelines and electrical cables are the main risks being managed at Phoenix. Security has been increased in an effort to halt the endemic theft of piping and cables that can affect the integrity of operations.

# OPERATIONS 2018 CONTINUED

## Central Plant Reclamation (tailings retreatment)

		FY18	FY17
<b>Number of employees</b>			
– Permanent		100	114
– Contractors		182	68
Total		282	182
<b>Operational</b>			
Volumes milled	(000t) (metric)	3 810	–
	(000t) (imperial)	4 201	–
Gold produced	(kg)	502	–
	(oz)	16 139	–
Gold sold		508	
		16 333	
Grade	(g/t)	0.132	–
	(oz/t)	0.004	–
Productivity	(g/TEC)	261.72	
<b>Financial</b>			
Revenue	(Rm)	293	–
	(US\$m)	23	–
Average gold price received	(R/kg)	576 829	
	(US\$/oz)	1 396	–
Cash operating cost	(Rm)	191	–
	(US\$m)	15	–
Production profit	(Rm)	98	–
	(US\$m)	8	–
Capital expenditure	(Rm)	22	156
	(US\$m)	2	11
Cash operating cost	(R/kg)	381 131	–
	(US\$/oz)	923	–
All-in sustaining cost	(R/kg)	420 016	–
	(US\$/oz)	1 017	–
<b>Safety</b>			
Number of fatalities		0	1
Lost-time injury frequency rate per million hours worked		0	12.51
<b>Environment</b>			
Electricity consumption	(GWh)	24	*
Water consumption – primary activities	(ML)	180	*
Greenhouse gas emissions	(000t CO <sub>2</sub> e)	0.04	*
Intensity data per tonne treated			
– energy		0.006	*
– water		0.05	*
– greenhouse gas emissions		0.006	*
Number of reportable environmental incidents		1	*

\* Reported as part of waste rock dumps prior to conversion of Central Plant as a tailings retreatment operation, which commenced operations in FY18.

## Central Plant Reclamation (tailings retreatment) *continued*

### Other salient features

Status of operation	Retreatment of tailings
Life of mine	18 years

### Mineral reserves as at 30 June 2018

Reserves (metric)	Proved reserves			Probable reserves			Total mineral reserves		
	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)
	–	–	–	64.6	0.27	17	64.6	0.27	17
Reserves (imperial)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)
	–	–	–	71.2	0.008	552	71.2	0.008	552

Central Plant Reclamation, a tailings retreatment operation situated near Welkom in the Free State, began production in July 2018. Central Plant, which previously processed waste rock dumps, was converted into a tailings retreatment operation during FY17.

Central Plant's inaugural annual performance was very successful. The operation processed 3.8 million tonnes and produced 502kg (16 139oz), at an all-in sustaining cost of R420 016/kg (US\$1 017/oz).

The capital expenditure for FY17 of R156 million (US\$11.5 million) was related to the Central Plant tailings conversion project which was completed on time and below budget.

Focus at the Central Plant is on improving plant efficiencies for optimal gold recovery. Increased security measures have been implemented to combat vandalism and theft, the main risks encountered.

# OPERATIONS 2018 CONTINUED

## Waste rock dumps

		FY18	FY17	FY16
<b>Operational</b>				
Volumes milled	(000t) (metric)	2 821	2 810	3 041
	(000t) (imperial)	3 110	3 099	3 353
Gold produced	(kg)	1 081	1 055	1 065
	(oz)	34 755	33 918	34 241
Grade	(g/t)	0.383	0.375	0.350
	(oz/t)	0.011	0.011	0.010
<b>Financial</b>				
Revenue	(Rm)	610	609	577
	(US\$m)	47	45	40
Average gold price received	(R/kg)	567 737	572 172	544 996
	(US\$/oz)	1 374	1 309	1 169
Cash operating cost	(Rm)	450	459	427
	(US\$m)	35	34	29
Production profit	(Rm)	164	142	158
	(US\$m)	13	10	11
Capital expenditure	(Rm)	3	7	18
	(US\$m)	–	1	1
Cash operating cost	(R/kg)	415 993	434 715	401 033
	(US\$/oz)	1 007	995	860
All-in sustaining cost	(R/kg)	417 462	445 451	422 205
	(US\$/oz)	1 010	1 019	906
<b>Safety</b>				
Number of fatalities		0	0	0
Lost-time injury frequency rate per million hours worked		0	0	0
<b>Environment</b>				
Electricity consumption	(GWh)	*	52	66
Water consumption – primary activities	(ML)	*	234	394
Greenhouse gas emissions	(000t CO <sub>2</sub> e)	*	51	67
Intensity data per tonne treated				
– energy		*	0.02	0.02
– water		*	0.08	0.12
– greenhouse gas emissions		*	0.02	0.02
Number of reportable environmental incidents		0	0	0

\* Electricity and water consumption and related emission and intensity data for the respective plants at which the waste rock dumps are processed are accounted for as part of the primary operation's environmental results.

## Waste rock dumps *continued*

### Other salient features

Status of operation	Processing of waste rock dumps is dependent on the availability of spare plant capacity and plant requirements for grinding material
Life of mine	± 1 year

### Mineral reserves as at 30 June 2018

Reserves (metric)	Proved reserves			Probable reserves			Total mineral reserves		
	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)
	–	–	–	3.9	0.51	2	3.9	0.51	2
Reserves (imperial)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)
	–	–	–	4.3	0.015	64	4.3	0.015	64

Production from the processing of surface rock dumps situated in the Free State province of South Africa depends entirely on the availability of spare mill capacity at the Harmony One and Target Plants, which in turn depends on the availability of underground ore delivered for milling. Waste and waste rock dump deliveries to Kusasalethu Plant (situated near the border of Gauteng and North West Province) supplement mining volumes in order to secure sufficient backfill to use as support in stoping areas. Waste rock dumps situated near Orkney and acquired as part of the Moab Khotsong operations are treated at the Nologwa and Mispah Plants. Milling of waste rock dumps at the Doornkop Plant, situated in the Gauteng province commenced in FY18.

The tailings retreatment conversion of the Central Plant in FY17 reduced capacity to process waste rock volumes. Waste rock dumps were not processed at the Central Plant in FY18 following the completion of the conversion of this plant to treat tailings.

Volumes milled, recovered grades and gold produced remained steady year on year. Production was boosted by the inclusion of Moab surface operations from 1 March 2018 and commencement of surface waste rock dump processing at the Doornkop Plant. Processing of ore and waste material received from Sibanye-Stillwater's Cooke operations, at Harmony's Doornkop plant was terminated in FY18.