



OPEN-PIT MINING



# Competent Person's Report on Ore Reserves and Mineral Resources

This report is issued as the annual update of resources and reserves to inform shareholders and potential investors of the mineral assets held by ARM.

- 58 List of operating divisions, assets and type of operation
- 59 General statement
- 60 ARM Ferrous
  - 60 ► Manganese mines
  - 64 ► Iron ore mine and project
  - 67 ► Chrome mine
- 69 ARM Platinum
  - 69 ► Nkomati nickel/copper/cobalt/PGM/chrome mine and project
  - 74 ► Two Rivers PGM mine
  - 77 ► Modikwa PGM mine
  - 80 ► Kalplats PGM project
- 83 ARM Coal
  - 83 ► Goedgevonden Coal Project
- 84 Competence
- 85 Definitions

# Asset location

SOUTH AFRICAN OPERATIONS



# General Statement

ARM's method of reporting Mineral Resources and Mineral Reserves conforms to the South African Code for Reporting Mineral Resources and Mineral Reserves (SAMREC Code) and the Australian Institute of Mining and Metallurgy Joint Ore Reserves Committee Code (JORC).

The convention adopted in this report is that Mineral Resources are reported inclusive of that portion of the total mineral resource converted to a mineral reserve. Resources and reserves are quoted as at 30 June 2007. External consulting firms audit the resources and reserves of the ARM operations on a three- to four-year cycle basis. Audits were last carried out during 2004 on all the operations, and currently audits are being carried out on TEAL projects.

Underground resources are in-situ tonnages at the postulated mining width, after deductions for geological losses. Underground Mineral Reserves reflect milled tonnages while surface Mineral Reserves (dumps) are in-situ tonnages

without dilution. Both are quoted at the grade fed to the plant. Open cast Mineral Resources are quoted as in-situ tonnages and Mineral Reserves are tonnages falling within an economic pit-shell.

The evaluation method is generally Ordinary Kriging with mining block sizes ranging from 10 x 10m to 100 x 100m to 250 x 250m in the plan view. The blocks vary in thickness from 2.5 to 50m. The Inverse Distance method is used in some instances and with similar block sizes. The Sichel-t and log-mean estimation methods are occasionally used for global estimation of resources, as is the weighted polygonal method. The evaluation process is fully computerised, generally utilising the Datamine software package.

The Mineral Resources and Mineral Reserves are reported on a total basis regardless of the attributable beneficial interest that ARM has on the individual projects or mines. When the attributable beneficial interests on a mine or

project is less than 100%, the actual percentage of the attributable interest is specified.

ARM comprises various operating divisions with varying attributable interests in assets. Refer to table below. A locality map showing the major operations appears on the preceding page.

Maps, plans and reports supporting resources and reserves are available for inspection at ARM's registered office and at the relevant mines.

In order to satisfy the requirements of the Minerals and Petroleum Resources Development Act, ARM's operations will have to obtain new mining rights for all properties required to support the planned operations over the next 30 years. The Act is effective from 1 May 2004 and the new rights must be obtained within five years from then. The operations are at various stages of application. Rounding of figures may result in computational discrepancies.

Operating Division	Operating Assets	Type
Platinum Division		
	Nkomati Mine	Mine and concentrator
	Nkomati Expansion Project	Mine, concentrator, refinery feasibility
	Modikwa Mine	Mine and concentrator
	Two Rivers Mine	Mine and concentrator
	Kalplats Project	Exploration asset
Iron Ore Division		
	Beeshoek Mine	Mine & dense medium separation (DMS)
	Khumani Mine (Bruce-King/Mokaning Project)	Construction of surface infrastructure in progress
Manganese Division		
	Nchwaning Mine	Mine, washing and screening
	Gloria Mine	Mine, washing and screening
	Cato Ridge Works	Ferro-manganese and silicon-manganese smelter
	Cato Ridge Alloys	Ferro-manganese refinery
Chrome Division		
	Dwarsrivier Mine	Mine and concentrator
	Machadodorp Works	Smelter and pelletising plant
Coal Division		
	Goedgevonden Project	Mine/project



# ARM Ferrous

## Assmang Limited's operations

ARM's attributable beneficial interest in Assmang's operations is 50%.

### MANGANESE

The manganese mines are situated in the Northern Cape province in South Africa, approximately 80km north-west of the town of Kuruman. Located at latitude 27°07'50"S and longitude 22°50'50"E, the site is accessed via the national N14 route between Johannesburg and Kuruman, and the provincial R31 road.

In 1940, ARM Ferrous acquired a manganese ore outcrop on a small hillock known as Black Rock. Several large properties underlain by ore were subsequently found and acquired. Today the Black Rock area is considered to be the largest and richest manganese deposit in the world. Manganese ore operations were extended and today include the Gloria and Nchwaning underground mines. Manganese ore is supplied locally to Assmang-owned smelters, but is mainly exported through Port Elizabeth to Japanese and German customers.

### MINING AUTHORISATION

The Nchwaning mining lease (ML10/76) comprises an area of 1 877.0587ha and is located on the farms Nchwaning (267), Santoy (230) and Belgravia (264). An application for the conversion to a new order mining right will be submitted during F2008.

The Gloria mining lease (ML11/83) comprises an area of 1 713.1276 hectares and is located on portion 1 of the farm Gloria (266). An application for the conversion to a new order mining right will be submitted during F2008.

### GEOLOGY

The manganese ores of the Kalahari Manganese field are contained within sediments of the Hotazel Formation of the Griqualand West Sequence, a subdivision of the Proterozoic Transvaal Supergroup. At Black Rock, Belgravia and Nchwaning, the Hotazel, Mapedi and Lucknow Formations have been duplicated by thrusting. The average thickness of the Hotazel Formation is approximately 40m.

The manganese orebodies exhibit a complex mineralogy and more than 200 mineral species have been identified to date. The hydrothermal upgrading has resulted in a zoning of the orebody with regard to fault positions. Distal areas exhibit more original and low-grade kutnohorite + braunite assemblages, while areas immediately adjacent to faults exhibit a very high-grade hausmannite ore. The intermediate areas exhibit a very complex mineralogy, which includes bixbyite, braunite and jacobsonite amongst a host of other manganese-bearing minerals. A similar type of zoning also exists in the vertical sense. At the top and bottom contacts it is common to have high iron (Fe) and low manganese (Mn) contents while the reverse is true towards the centre of the seam. This vertical zoning has given rise to a mining practice where only the centre 3.5m-high portion of the seam is being mined. At the Gloria mine the intensity of faulting is much less, which also explains the lower grade.

### RESOURCES/RESERVES

Measured Resources are classified as material available up to 50m in front of the mining faces. Material situated further than 50m from current development is classified as Indicated Resources. These classification criteria is currently under review as it is felt that Measured Resources are extremely under-quoted. Geological losses are built into the grade model. Measured Resources are converted to Proved Reserves taking a 20% pillar loss (Nchwaning) into account (23% for Gloria). In the same way Probable Reserves are obtained from the Indicated Resources. Two manganese seams are present. The No.1 seam is up to 6m in thickness, of which 3.5m are mined, using a manganese marker zone for control. There is, therefore, minimum dilution.

The Nchwaning mine was diamond drilled from surface at 330m centres and the data captured in Excel spreadsheets. The core was logged and 0.5m-long, half-core, diamond-saw cut samples were submitted to Assmang's laboratory at Black Rock for X-ray fluorescence (XRF) analyses. Mn and Fe values were checked by Wet Chemical analyses. Several standards were used to calibrate XRF equipment, and results were compared with other laboratories on a regular basis.

A total of 341 boreholes for the No 1 orebody and 372 holes for the No 2 orebody, as well as a total of 20 080 face samples were considered in the grade estimation. The available data for an area was optimised over a thickness of 3.5m and exported into data files for computerised statistical and geostatistical manipulation to determine the average grades of Mn, Fe, silica (SiO<sub>2</sub>), calcium (CaO) and magnesium (MgO).

Ordinary Kriging interpolation within Datamine was used to estimate the grade of each 50 x 50 x 3.5m block generated within the geological model. Sub-cell splitting of the 50 x 50m blocks was allowed to follow the geological boundaries accurately. The relative density of Nchwaning manganese ore was taken as 4.3t/m<sup>3</sup>.

The F2007 Mineral Reserves for the Nchwaning No 1 orebody changed slightly from 116.8Mt in 2006 to 114.6Mt (-1.88%) in 2007 as a result of the orebody being re-modelled and the annual production draw-down. Similarly, the Mineral Resources at Nchwaning No 1 orebody decreased by 2.6Mt to 143.4Mt (146Mt). The Mineral Resources at Nchwaning No 2 orebody decreased slightly to 181.9Mt (184.7Mt).

Procedures for drilling and assaying at Gloria mine are the same as at Nchwaning. A total of 103 boreholes were considered in the evaluation of the Gloria mine. The wide-spaced borehole interval puts some limitation on the evaluation in areas away from current mining faces. A total of 5 166 underground sampling values were used in evaluating areas close to current mining.

The boreholes were optimised over a stoping width of 3.5m and the relative density was taken as 3.8t/m<sup>3</sup>. The seams were evaluated by means of statistical and geostatistical methods to determine the average grades of Mn, Fe, SiO<sub>2</sub>, CaO and MgO.

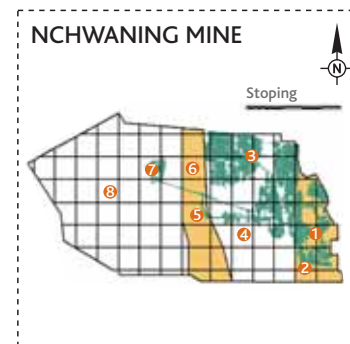
Ordinary Kriging interpolation within Datamine was used to estimate the grade of each 50 x 50 x 3.5m block generated within the geological model. Sub-cell splitting of the 50 x 50m blocks was allowed to follow the geological boundaries.

NCHWANING MINE: 2 BODY MANGANESE RESOURCES				
Map code	Nchwaning 2 Body Resources	Tonnes Mt	Mn%	Fe%
2	Area 1 Indicated	20.0	43.6	15.9
4	Area 2 Indicated	56.5	42.7	15.1
6	Graben Indicated	17.1	42.7	16.6
8	Area 3 Indicated	88.3	41.9	15.4
	Total Indicated	181.9	42.4	15.5
	<b>Total Resources 2 Body</b>	<b>181.9</b>	<b>42.4</b>	<b>15.5</b>

Measured resources = Immediately available tonnes up to 50m in front of mining faces, elsewhere classified as Indicated.

Proved Resources = Measured Resources less 20% pillar loss.

Probable Reserves = Indicated Resources less 20% pillar loss.

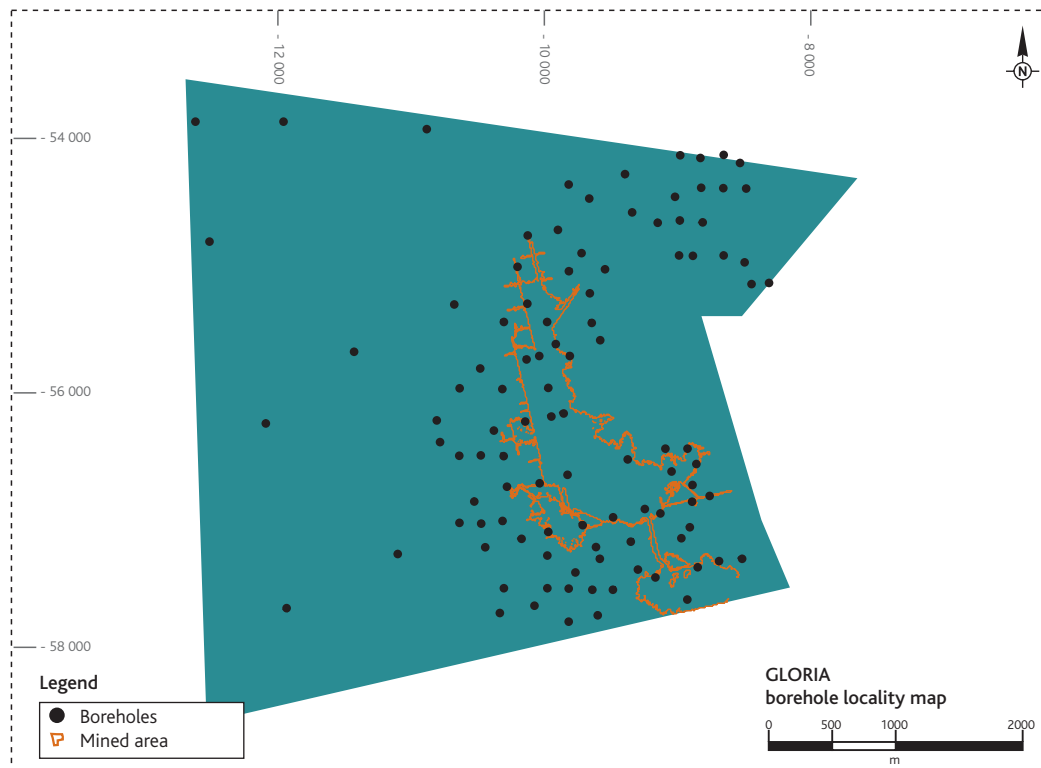
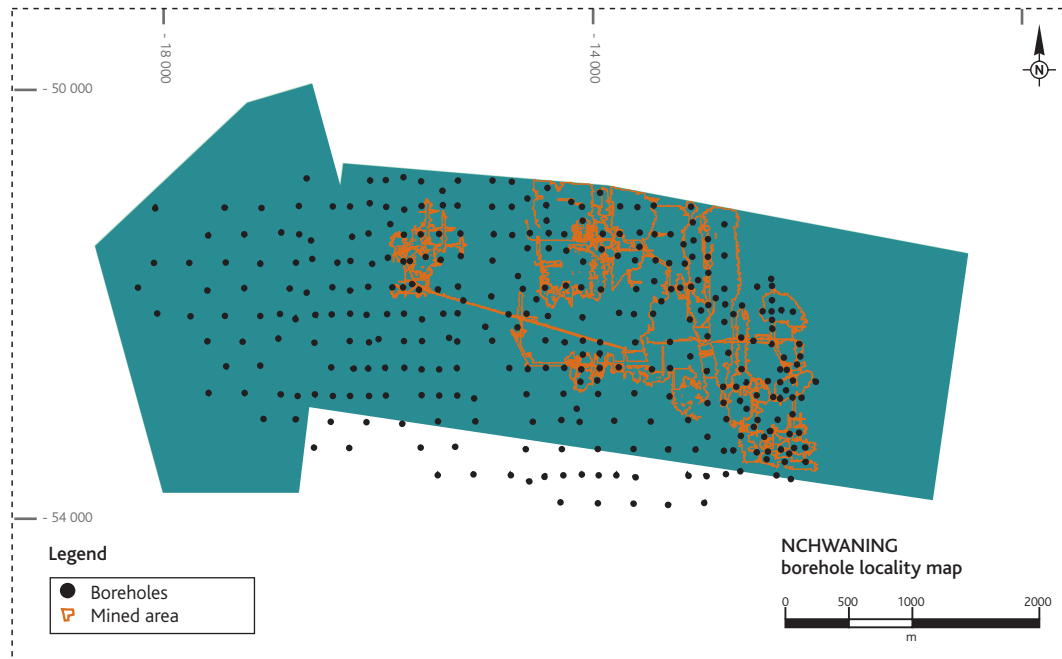


NCHWANING MINE: 1 BODY MANGANESE RESOURCES/RESERVES						
Map code	Nchwaning 1 Body Resources	Tonnes Mt	Nchwaning 1 Body Reserves	Tonnes Mt	Mn%	Fe%
1	Area 1 Measured	1.51	Area 1 Proved	1.21	48.8	8.97
2	Area 1 Indicated	5.33	Area 1 Probable	4.26	38.9	6.04
3	Area 2 Measured	7.45	Area 2 Proved	5.96	45.8	8.97
4	Area 2 Indicated	19.1	Area 2 Probable	15.28	44.5	9.4
5	Graben Measured	0.90	Graben Proved	0.72	46.7	10.1
6	Graben Indicated	16.1	Graben Probable	12.9	48.7	9.6
7	Area 3 Measured	6.20	Area 3 Proved	4.96	46.6	9.9
8	Area 3 Indicated	86.8	Area 3 Probable	69.4	44.2	8.7
	Total Measured	16.1	Total Proved	12.85	46.4	9.4
	Total Indicated	127.3	Total Probable	101.8	44.6	8.8
	<b>Total Resources 1 Body</b>	<b>143.40</b>	<b>Total Reserves 1 Body</b>	<b>114.7</b>	<b>44.8</b>	<b>8.87</b>



# ARM Ferrous

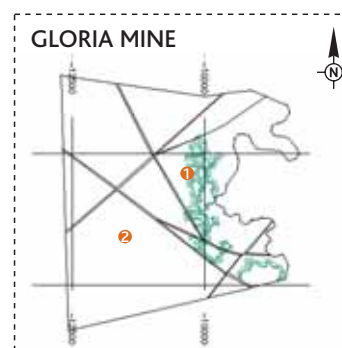
Assmang Limited's operations continued



#### GLORIA MINE: 2 BODY MANGANESE RESOURCES

	Gloria 2 Body Resources	Tonnes Mt	Mn%	Fe%
	Indicated	67.9	31.9	10.98
	Inferred	70.3	—	—

Measured Resources = Immediately Available tonnes up to 50 metre in front of mining faces, else classified as Indicated. Proved Resources = Measured. Resources less 23% pillar loss.  
Probable Reserves = Indicated Resources less 23% pillar loss.



#### GLORIA MINE: 1 BODY MANGANESE RESOURCES/RESERVES

Map code	Gloria 1 Body Resources	Tonnes Mt	Gloria 1 Body Reserves	Tonnes Mt	Mn%	Fe%
1	Measured	10.0	Proved	7.7	38.4	5.07
2	Indicated	87.6	Probable	67.4	38.3	5.67
	Meas+Ind Resources 1 Body	97.6	Total Reserves 1 Body	75.1	38.3	5.67
	Inferred	70.3	—	—	—	—

The F2007 Mineral Reserves at Gloria No 1 orebody stayed the same at 75.3Mt. The Measured and Indicated Mineral Resources at Gloria No 1 orebody showed a minor decrease from 97.7 to 97.6Mt. Only limited production took place at Gloria for the year under review. The Mineral Resources at Gloria No 2 orebody stayed the same at 138.2Mt.

#### HISTORICAL PRODUCTION AT NCHWANING AND GLORIA MINES

Financial year	Nchwaning Mt	Gloria Mt
2002	1.1	0.53
2003	1.02	0.49
2004	1.17	0.33
2005	1.97	0.15
2006	2.83	0.13
2007	2.49	0.43

Trackless mechanised equipment is used in the bord and pillar mining method. Mining in the eastern extremity of Nchwaning occurs at a depth of 200m while the deepest (current) excavations can be found at a depth of 519m below surface. Gloria Mine is extracting manganese at depths that vary between 180 and 250m below surface.

Ore from Nchwaning No 2 mine is crushed underground before being hoisted to a surface stockpile via a vertical shaft. Similarly, ore from the Nchwaning No 3 mine is crushed underground before being conveyed to a surface stockpile via a declined conveyor system. Ore is withdrawn from the surface stockpile and forwarded to two stages of crushing, dry screening and wet screening to yield lumpy and fine products.

At the Gloria mine, ore is crushed underground before being conveyed to a surface stockpile via a decline shaft. Ore is withdrawn from the surface stockpile and forwarded to crushing, dry screening and wet screening to yield lumpy and fine products.

At both plants the finer fractions are stockpiled while the coarser fractions are extracted from the respective product boxes into road haulers, sampled, weighed and stored on stacks ahead of despatch. Samples from each stack are analysed for chemical content and size distribution. This ensures good quality control and enables the ore control department to blend various stacks according to customer demand.

At current production rates and an annual increase of 10% the Nchwaning life of mine on No 1 orebody is expected to be 30 years. This will include blending in ore from the No 2 orebody, to supply a Fe-rich product. The life of mine on Gloria No 1 orebody is estimated at more than 30 years.



# ARM Ferrous

## Assmang Limited's operations continued

### IRON ORE

The Iron Ore Division is made up of the Beeshoek mine located on the farms Beeshoek 448 and Olynfontein 475. The iron ore resources on the farms Bruce 544, King 561, and Mokaning 560, which were formerly known as the BKM Project, are now being developed into what in future will be known as the Khumani iron ore mine. All properties are in the Northern Cape approximately 200km west of Kimberley. The Beeshoek open-pit operations are situated 7km west of Postmasburg and the new Khumani open pits will be adjacent to, and south-east of, the Sishen mine, which is operated by Kumba Resources. Located at latitude 28°30'00"S / longitude 23°01'00"E, and latitude 27°45'00"S / longitude 23°00'00"E respectively, these mines supply iron ore to both the local and export markets. Exports are railed to the iron ore terminal at Saldanha Bay.

Mining of iron ore (mainly specularite) was undertaken as early as 40 000 BC on the farm Doornfontein which is due north of Beeshoek. The potential of iron ore in this region was discovered in 1909, but, due to lack of demand and limited infrastructure, this commodity was given little attention. In 1929 the railway line was extended from Koopmansfontein (near Kimberley) to service a manganese mine at Beeshoek. In 1935 the Associated Manganese Mines of South Africa Limited (Assmang) was formed, and in 1964 the Beeshoek iron ore mine was established, with a basic hand sorting operation. In 1975 a full washing and screening plant was installed and production increased over the years to the current level of approximately 6Mt a year.

### MINING AUTHORISATION

The Beeshoek mining lease (ML3/93) comprises an area of 5 685.64ha and is located on the farms Beeshoek (448) and Olynfontein (475). An application for the conversion to a new order mining right will be submitted during F2008.

The Khumani mining lease comprises an area of 7 388.02ha and is located on the farms Bruce (544), King (561), Mokaning (560) and McCarthy (559). Mining rights were granted during F2007.

### GEOLOGY

The iron ore deposits are contained within a sequence of early Proterozoic sediments of the Transvaal Supergroup deposited between 2 500 and 2 200 million years ago. In general two ore types are present, namely laminated hematite ore forming part of the Manganore Iron Formation and conglomerate ore belonging to the Doornfontein Conglomerate Member at the base of the Gamagara Formation.

The older laminated ore types occur in the upper portion of the Manganore Iron Formation as enriched high-grade hematite bodies. The boundaries of high-grade hematite orebodies crosscut primary sedimentary bedding, indicating that secondary hematitisation of the iron formation took place. In all of these, some of the stratigraphic and sedimentological features of the original iron formation are preserved.

The conglomeratic ore is found in the Doornfontein Conglomerate Member of the Gamagara Formation and is lenticular and not persistently developed along strike. It consists of stacked, upward fining conglomerate-gritstone-shale sedimentary cycles. The lowest conglomerates and gritstones tend to be rich in sub-rounded to rounded hematite ore pebbles and granules and form the main orebodies. The amount of iron ore pebbles decreases upwards in the sequence so that upper conglomerates normally consist of poorly sorted, angular to rounded chert and banded iron formation pebbles.

The erosion of the northern Khumani deposit is less than that in the southern Beeshoek area. The result is that Khumani is characterised by larger stratiform bodies and prominent hangingwall outcrops. The down-dip portions are well preserved and developed, but in outcrop the deposits are thin and isolated. Numerous deeper extensions occur into the basins due to karst development. A prominent north-south strike of the ore is visible. The southern Beeshoek orebodies were exposed to more erosion and are more localised and smaller. Outcrops are limited to the higher topography on the eastern side of the properties. Down dip to the west, the ore is thin and deep. The strike of the orebodies is also in a north-south direction, but less continuous.

Haematite is the predominant ore mineral, but limonite and specularite also occur.

### RESOURCES/RESERVES

In the iron ore operations, the following table shows how the search ellipse (i.e. the ellipsoid used by the Kriging process to determine if a sample is used in the estimation of a block) is used to classify the Mineral Resource:

Only Measured and Indicated Resources are converted to Proved and Probable Reserves respectively.

#### MINERAL RESOURCE CLASSIFICATION CRITERIA

	Min no. of samples	Max no. of samples	Search ellipse settings XYZ (m)
Measured	6	30	100x100x10
Indicated	5	30	200x200x20
Inferred	4	30	400x400x40

# BEESHOEK IRON ORE: RESOURCES/RESERVES PLAN

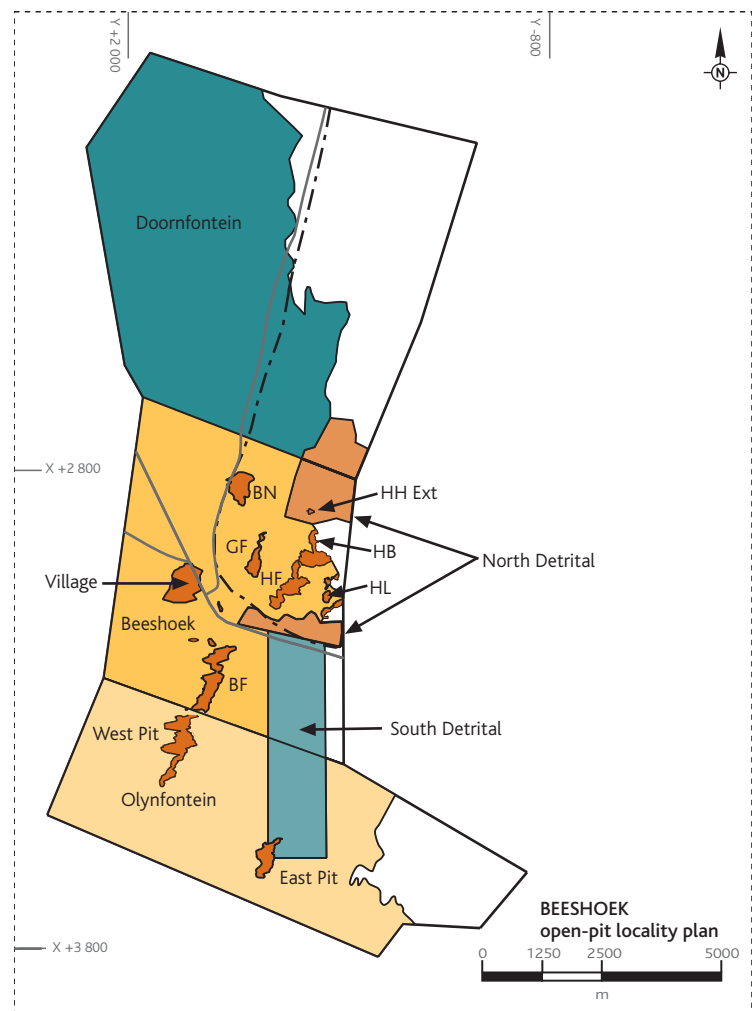
Pit/Area	Measured		Indicated		Inferred		Total Resource		Proved Reserve		Probable Reserve		Total Reserve	
	Mt	Fe%	Mt	Fe%	Mt	Fe%	Mt	Fe%	Mt	Fe%	Mt	Fe%	Mt	Fe%
BN	26.36	63.53	0.02	63.61	—	—	26.38	63.53	18.86	64.01	0.58	64.32	19.44	64.02
GF	3.46	63.95	0.09	61.80	—	—	3.55	63.81						
HF/HB	16.4	63.92	0.01	62.33	—	—	16.41	63.92	2.84	65.23	0.03	66.45	2.87	65.25
HH Ext	0.28	62.63	—	—	—	—	0.28	62.63						
HL	3.92	64.83	—	—	—	—	3.92	64.83						
N Detrital	—	—	5.9	60.00	—	—	5.9	60.00						
Village	40.79	63.56	0.10	64.64	—	—	40.89	63.57						
BF	9.99	63.30	0.23	63.55	—	—	10.23	63.30	4.72	63.83	0.01	62.54	4.73	63.82
West Pit	10.19	63.04	0.05	64.05	—	—	10.24	63.04						
East Pit	9.35	64.61	—	—	0.05	61.87	9.39	64.61	1.58	65.02			1.58	65.02
S Detrital	—	—	7.35	60.00	—	—	7.35	60.00						
<b>TOTAL</b>	<b>120.74</b>	<b>63.67</b>	<b>13.75</b>	<b>60.07</b>	<b>0.05</b>	<b>61.87</b>	<b>134.54</b>	<b>63.31</b>	<b>28.00</b>	<b>64.16</b>	<b>0.62</b>	<b>64.03</b>	<b>28.62</b>	<b>64.16</b>

## HISTORICAL PRODUCTION AT BEESHOEK MINE

Financial Year	Tons ore mined ( Mt)
2002	7.72
2003	7.11
2004	7.57
2005	7.86
2006	7.72
2007	13.26

Modifying factors were applied to these resources and financially optimised. The financial outline is used to define the optimal pit by means of the Lersch-Grossman algorithm. The resources within this mining constraint are defined as reserves. These are categorised into different product types, destined for the different plant processes and scheduled for planning.

The methodology followed to identify targets is initiated with geological mapping, followed by geophysics (ground magnetics and gravity). Percussion drilling is used to pilot holes through overlying waste rock down to the iron ore bodies. Diamond drilling is the next phase, which is usually on a 200 x 200m grid. Further infill drilling is carried out at spacing ranging from 100 x 100m to 25 x 25m, depending on the complexity of the geological structures. Numerous exploration programmes were completed in the last 40 years. A total of 2 832 holes (1 315 holes on Khumani and 1 517 holes on Beeshoek) were drilled. Core samples were logged and split by means of a diamond saw and the half-core is sampled every 0.5m. Before submission for assaying, the half-cores were crushed, split and pulverised. Samples with values larger than 60% are included in the definition of the orebodies. Any lower-grade samples inside the orebody are defined as internal waste and modelled separately. Each zone is modelled per section, and then wireframed to get a three-dimensional (3D) model.



# ARM Ferrous

## Assmang Limited's operations continued

KHUMANI IRON MINE: RESOURCES/RESERVES PLAN

Area	Measured		Indicated		Inferred		Total Meas & Ind		Proved Reserve		Probable Reserve		Total Reserve	
	Mt	Fe%	Mt	Fe%	Mt	Fe%	Mt	Fe%	Mt	Fe%	Mt	Fe%	Mt	Fe%
Bruce A	23.5	64.91	99.0	64.54	0.8	63.37	122.5	64.60	17.1	65.20	57.2	64.70	74.3	64.82
Bruce B	21.1	65.71	77.0	64.06	8.7	64.64	98.1	64.43	19.4	65.70	44.7	64.40	64.1	64.79
Bruce C	37.5	65.45	6.9	65.95	1.6	64.80	44.4	65.50	34.1	65.50	1.4	65.90	35.5	65.52
King/ Mokaning	255.8	64.53	123.9	64.48	17.7	63.98	379.7	64.49	202.6	64.50	68.2	64.60	270.8	64.53
Khumani Detrital	—	—	—	—	12.0	60.00	—	—	—	—	—	—	—	—
<b>TOTAL</b>	<b>337.9</b>	<b>64.73</b>	<b>306.8</b>	<b>64.43</b>	<b>40.8</b>	<b>62.97</b>	<b>644.7</b>	<b>64.59</b>	<b>273.2</b>	<b>64.75</b>	<b>171.5</b>	<b>64.59</b>	<b>444.7</b>	<b>64.69</b>

Ordinary Kriging interpolation within Datamine was used to estimate the grade of each 10 x 10 x 10m block generated within the geological model. Density in the resource model is calculated using a fourth degree polynomial fit applied to the estimated Fe grade. Densities range from 4.38 t/m<sup>3</sup> (60% Fe) to 5.01 t/m<sup>3</sup> (68% Fe). A default density of 3.2 is used for waste.

At Beeshoek all blast holes are sampled per metre, but composited per hole. All holes are analysed for density and blast holes in ore are sampled and analysed for Fe, potassium oxide (K<sub>2</sub>O), sodium oxide (Na<sub>2</sub>O), silica (SiO<sub>2</sub>), aluminium oxide (Al<sub>2</sub>O<sub>3</sub>), phosphorus (P), sulphur (S), CaO, MgO, Mn and barium oxide (BaO). Every fifth blast hole is geologically logged per metre, which is used to update the geological model. The chemical results of these

holes are used to update the ore block model. Approximately 45 000 blast holes are drilled a year and 9 000 blast holes are used every year to update the models. The major analytical technique for elemental analyses is XRF spectroscopy. Volumetric titration is used as verification method for the determination of total iron in the ore. International standards (e.g. SARM11) and in-house iron standards are used for calibration of the XRF spectrometer. The Beeshoek laboratory participates in a round robin group that includes seven laboratories for verification of assay results.

The 2007 Mineral Resources at Beeshoek mine decreased from 147.8 to 134.5Mt, due to the annual production drawdown. The Mineral Reserves at Beeshoek decreased substantially from 37.4Mt to 28.6Mt, mainly due to the exclusion of the Village deposit. The high stripping ratio of 4.5t of waste to 1t of ore militates against the inclusion of this in reserve. Ore Reserves at pits such as East pit and the BF pit were drawn down heavily to meet sales requirements. Of the 28Mt of Mineral Reserves available, only about 33% is suitable for the ordinary wash-and-screen process, limiting the life of mine at Beeshoek to approximately one year for the current export ore qualities. The Khumani mine will take over the Beeshoek export production in 2008.

At Khumani mine the 2007 Mineral Resources and Ore Reserves remain the same when compared to 2006. The Mineral Reserves amount to 444.7Mt at a Fe grade of 64.7%. Resources and reserves were audited and signed-off by Snowden Mining Consultants in February 2005. Infrastructure construction is in progress, and production is to start in 2008, with an estimated life of mine of 30 years.



Mining operations are all open pit, based on the conventional drill-and-blast, truck-and-shovel operations. Run-of-mine ore is crushed and stored as high or normal grade on blending stockpiles. Ore from the stockpiles is either sent to the wash-and-screen plant or, if contaminated, to the beneficiation plant. The washing and screening plant consist primarily of tertiary crushing, washing, screening, conveying and stacking equipment. The beneficiation plant consists of tertiary crushers; scrubbers; coarse and fine jigs or Larcodemers; fine crushing; elutriators and upward flow classifiers; lumpy, fines and scaw product stockpiles; and a rapid load-out facility. No chemical is being used in any of the treatment plants.

## CHROMITE

Chromite operations at Dwarsrivier mine form part of the chrome division of Assmang Limited. The mine is situated on the farm Dwarsrivier 372KT, approximately 30km from Steelpoort and 60km from Lydenburg, in Mpumalanga Province in South Africa. Located at longitude 30°05'00"S/latitude 24°59'00"E, Assmang purchased the farm from Gold Fields Limited, together with all surface and mineral rights in October 1998. Neighbouring properties to the north and south of Dwarsrivier had existing chrome mining operations at the time of purchase. The feasibility study of the plant, tailings dam and designs for the opencast and underground mines then commenced. After the completion of the consolidated assessment, approval to proceed with the final design and construction work was given in July 1999.

Chromite was obtained from the opencast mining areas at a rate of approximately 0.9Mt a year and these areas were mined out within five years. Underground mining commenced in 2005 at a rate of 1.2Mt a year. Dwarsrivier mine is specifically geared to deliver high quality metallurgical grade chromite to the Machadodorp smelter. In addition, the plant has been designed to produce chemical and foundry grade products.

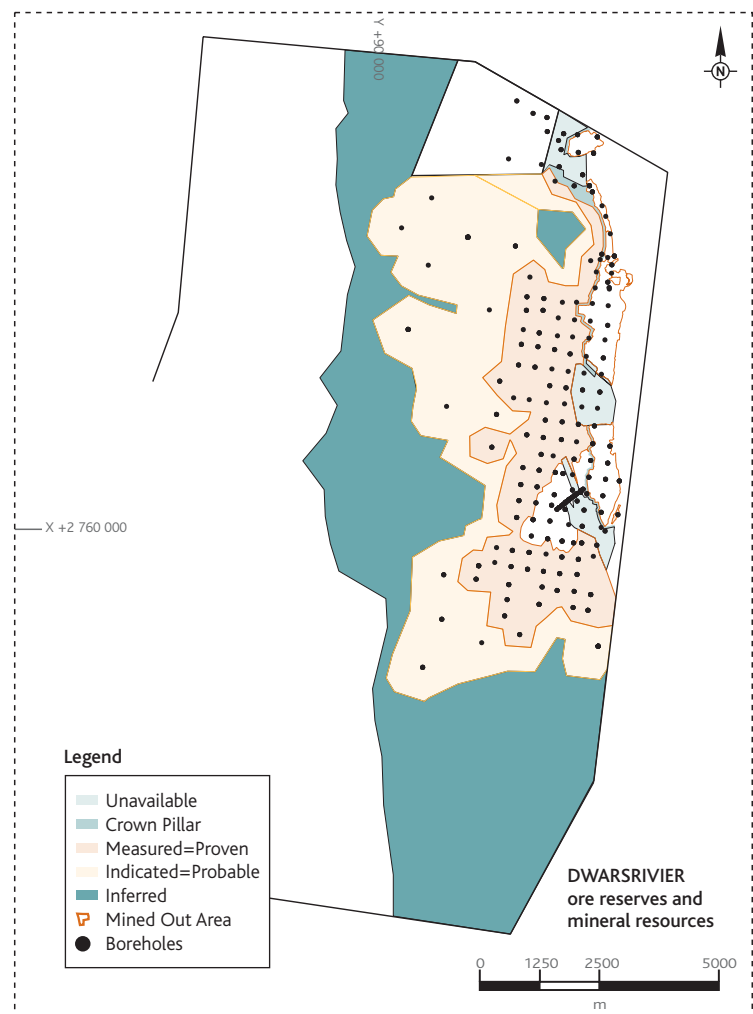
## MINING AUTHORISATION

An old order Mining Licence 21/99 was granted in October 1999. It was granted for the mining of chrome and platinum group metals. An application for the conversion to a new order mining right will be submitted during F2008.

## GEOLOGY

Dwarsrivier mine is situated in the eastern limb of the Bushveld Complex, which comprises persistent layers of mafic and ultramafic rocks, containing the world's largest known resources of platinum group metals, chromium and vanadium. The mafic rocks termed the Rustenburg Layered Suite, are approximately 8km thick in the eastern lobe, and are divided formally into five zones.

The rocks of the Marginal Zone at the base of the succession consist mainly of pyroxenites with some dunites and harzburgites. Above the Marginal Zone, the Lower Zone comprises mainly pyroxenites, harzburgites and dunite, and is present only in the northern part of the Eastern Lobe, and only as far south as Steelpoort. The appearance of chromitite layers marks the start of the Critical Zone, economically the most important zone. The layers are grouped into three sets termed the Lower, Middle and Upper groups. The sixth chromitite seam in the Lower Group (LG6), is an important source of chromite ore and is the orebody being mined at Dwarsrivier mine. In the Eastern Lobe, in the vicinity of Dwarsrivier, the strike is nearly north-south, with a dip of approximately 10° towards the west. Average thickness of the LG6 seam is about 1.86m in the Dwarsrivier area. Pipe-like dunite intrusions are evident in the area, as well as dolerite dykes that on average strike northeast-southwest. No significant grade variation is evident, especially not vertically in the ore seam. Small, insignificant regional variations do, however, exist.





# ARM Ferrous

## Assmang Limited's operations continued

### DWARSRIVIER MINE: CHROME RESOURCES/RESERVES PLAN

Chrome Resources	Tonnes Mt	Cr <sub>2</sub> O <sub>3</sub> %	FeO%	Chrome reserves	Mt	Cr <sub>2</sub> O <sub>3</sub> %	FeO%
Measured	16.92	39.32	23.21	Proved	13.5	39.32	23.21
Indicated	28.72	39.06	22.55	Probable	22.9	39.06	22.55
<b>Total Measured and Indicated</b>	<b>45.64</b>	<b>39.16</b>	<b>22.79</b>	<b>Total Reserves</b>	<b>36.4</b>	<b>39.16</b>	<b>22.79</b>
Inferred	53.11	39.00	22.71				

### RESOURCES/RESERVES

Information was obtained from boreholes with a 300- to 150m grid spacing. Resources were determined with a decreasing level of confidence.

- ▶ Measured Resource (150m drill grid spacing);
- ▶ Indicated Resource (300m drill grid spacing); and
- ▶ Inferred Resource (drill grid spacing greater than 300m)

All possible resources down to a mineable depth of 350m below ground level have been considered.

### HISTORICAL PRODUCTION AT DWARSRIVIER CHROME MINE

Financial Year	Ore Mined (Mt)
2002	0.70
2003	0.85
2004	0.96
2005	0.92
2006	0.82
2007	1.07

A strategy to ensure the availability of adequate information ahead of mining activities is in place. The strategy is to ensure all mining areas falling within the first five years of the life of mine plan contain proved reserves. Vertical diamond drilling holes are used, except where information is needed to clarify large-scale fault planes. The Mineral Resource at Dwarsrivier mine is based on a total of 230 diamond drill holes that have been used for grade estimation and orebody modelling purposes. The drill core is NQ size and is geologically and geo-technically logged. The collar position of the drill holes is surveyed, but no down-hole surveys are done, and the holes are assumed to have minimal deflection.

The chromitite seam is bounded above and below by pyroxenites. As such, the ore horizon is clearly defined. The core is sampled from the top contact downwards at 0.5m intervals. The core is split and half is retained as reference material in the core sheds. The other half is crushed and split into representative samples, which are crushed and pulverised for chemical analysis. The samples are analysed fusion/ICP-OES for chrome oxide (Cr<sub>2</sub>O<sub>3</sub>), SiO<sub>2</sub>, FeO, Al<sub>2</sub>O<sub>3</sub>, MgO and CaO. Three laboratories, all ISO 17025 accredited for this method, are used. Every tenth sample is analysed in duplicate. SARM 8 and SARM 9 standards, as well as in-house reference material (CRI), are included every 20 to 30 samples in each batch. The density for each sample is measured using a gas pycnometer.

Datamine software is used to construct a 3-D geological model (wireframe) of the LG6 chromite seam, based on borehole and other geological data. A cut-off value of 35% Cr<sub>2</sub>O<sub>3</sub> was used to distinguish between ore and waste. Mineral Resources have been calculated using Ordinary Kriging, where Cr<sub>2</sub>O<sub>3</sub>-, FeO-, Al<sub>2</sub>O<sub>3</sub>-, MnO and MgO-contents of the LG6 seam and densities were determined, using block sizes of 50 x 50 x 4m.

When compared to 2006, the 2007 Mineral Reserves increased by 6.2Mt or 20% to 36.4Mt (30.2Mt) and the Mineral Resources show an increase of 4Mt or 10% to 45.6Mt (41.6Mt). The reason for the change is that an additional 300m exploration drilling increased the Indicated resource base from the Inferred category. An exchange of information with the neighbouring Thorncliffe mine led to the re-interpretation of the 350mbgl that led to an increase in the Inferred resources.

During mining, a slightly diluted run of mine ore is fed to the beneficiation plant. This decreases the average grade from approximately 40% Cr<sub>2</sub>O<sub>3</sub> to 37% Cr<sub>2</sub>O<sub>3</sub>. An addition of approximately 9% of waste material results in this 3% Cr<sub>2</sub>O<sub>3</sub> grade decrease. In the dense media separation part of the plant, the coarse fraction is upgraded to 40% Cr<sub>2</sub>O<sub>3</sub>, with a yield of 80%. In the spiral section of the plant the finer fraction is upgraded to 44% Cr<sub>2</sub>O<sub>3</sub>, and 46% Cr<sub>2</sub>O<sub>3</sub> respectively, for metallurgical grade fines and chemical grade fines. Foundry sand is also produced with a similar grade to that of the chemical grade fines. A 67% yield is achieved in the spiral circuit.

The current life of mine of the Dwarsrivier chrome mine is more than 30 years. Excluded from this plan are the Inferred Mineral Resources and material situated deeper than 350m below ground level.

# ARM Platinum Operations

## NKOMATI NICKEL-COPPER-COBALT- PGM-CHROMITE MINE

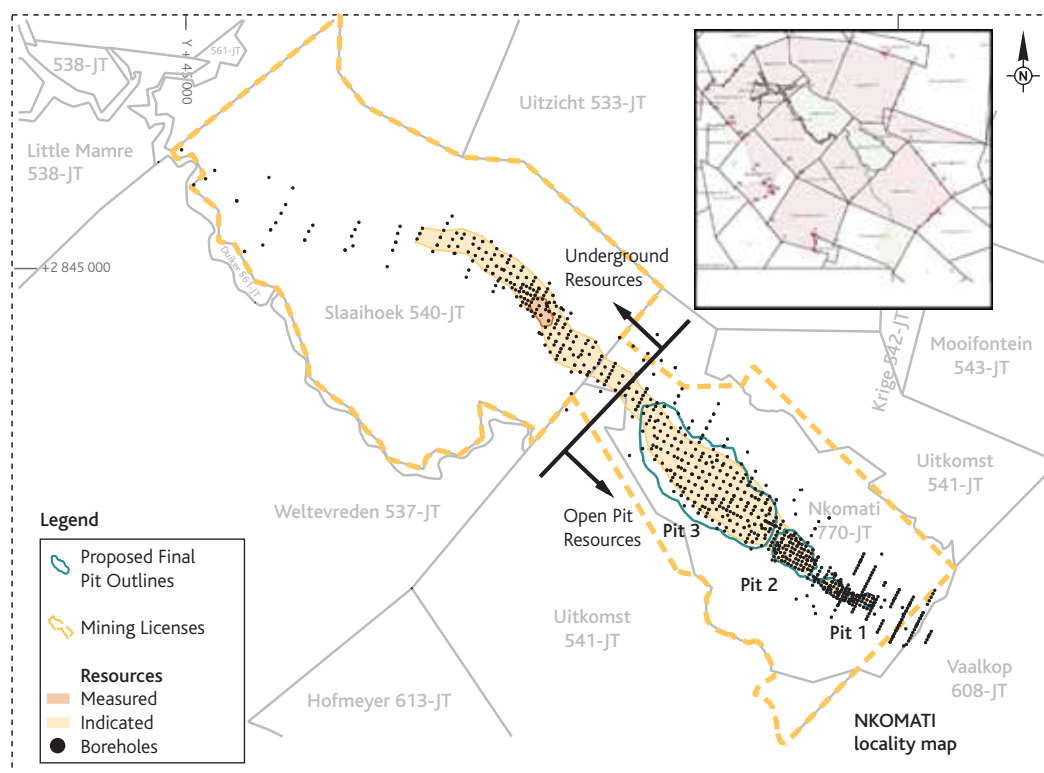
The Nkomati mine is situated some 300km east of Johannesburg in Mpumalanga province in South Africa. Situated at latitude 25°40'S and longitude 30°30'E, the site is accessed via the national N4 highway between Johannesburg and Machadodorp, the R341 provincial road and the R351 tarred road.

Nickel, copper, cobalt, PGM and chromite mineralisation is hosted by the Uitkomst Complex, a layered mafic-ultramafic, Bushveld satellite intrusion. The Uitkomst Complex outcrops on two farms, Slaaihoek 540JT and Nkomati 770 JT (a consolidation of portions of Uitkomst 541 JT and Vaalkop 608 JT). In 1929, the mineral rights on Slaaihoek were purchased by ETC, an Anglovaal subsidiary, to mine gold at the old Mamre and Slaaihoek mines. In the early 1970s, an Anglo American/INCO Joint Venture began exploring Uitkomst for nickel. In 1990, Anglo American (AAC) completed a feasibility study on an open-pit operation exploiting the large disseminated sulphide resource on Uitkomst, with negative results. Exploration on Slaaihoek by Anglovaal began in earnest in 1989, and in 1991, the first holes were drilled into the massive sulphide body (MSB). In 1995, the Nkomati JV between Anglovaal (75%) and AAC (25%) was formed and in January 1997, production of the MSB began. In 2004, Anglovaal acquired AAC's 25% interest and in 2005, a 50:50 JV was formed between ARM and LionOre, a global nickel producer and owner of the Activox technology. In February 2006, Nkomati approved an interim, Phase 1 expansion project which will exploit the MMZ, a disseminated sulphide body, by underground and open-pit mining. The project, which is planned to be commissioned in September 2007, will maintain nickel production at approximately 5,000t a year after the depletion of the MSB. A feasibility study for the full, Phase 2 expansion phase will be completed by August 2007.

In June 2006, following a trial mining operation, a feasibility study on mining the oxidised massive chromitite was completed and approval was given for a 60,000tpm mining and processing operation.

### MINING AUTHORISATION

Old order Mining Licences, numbers 3/2001 and 27/2003, exist on the farms Slaaihoek and Nkomati respectively for the mining of nickel, copper, cobalt, PGM and chromite. An application for the conversion to a new order mining right was submitted in July 2006. This matter is still under consideration with the DME.



# ARM Platinum Operations continued

## OXIDISED MASSIVE CHROMITITE RESOURCE (with depletion by production as at June 2007)

Chromitite (at 30% Cr <sub>2</sub> O <sub>3</sub> cut off)	Tonnes	Cr <sub>2</sub> O <sub>3</sub> %
Measured Resource	735 000	36.36
Indicated Resource	5 498 000	33.08
<b>Total Measured &amp; Indicated Resource</b>	<b>6 233 000</b>	<b>33.47</b>
Inferred Resource	2 373 000	32.85

In addition, in March 2007, a new order prospecting right (ref. MP305112545PR) was granted to ARM Platinum in respect 14 farms (24,965 ha) surrounding the Nkomati mining licences.

## GEOLOGY

The Uitkomst Complex is a Bushveld-age layered, mafic-ultramafic body intruded into the basal sediments of the Transvaal Supergroup, which lies unconformably on an Archean granitic basement. The complex is a long linear body, which outcrops in the Slaaihoek valley for approximately 8km and dips below an escarpment where it has been drilled at depth for an additional 4km. The complex, which dips at approximately 4° to the north-west, is still open-ended.

From the base to top, the stratigraphy of the Uitkomst Complex comprises the Basal Gabbro Unit (up to 15m thick), the Lower Pyroxenite Unit (average 35m), the Chromititic Peridotite Unit (30 to 60m), the Massive Chromitite Unit (up to 10m), the Peridotite Unit (330m), the Upper Pyroxenite Unit (65m), the Gabbro-norite Unit (250m), and the Upper Gabbro Unit (50m). The complex and surrounding sediments are intruded by numerous diabase sills up to 30m in thickness.

## 2007 MINERAL RESOURCES, NKOMATI MINE & PHASE 2 EXPANSION PROJECT (with depletion by production as at 30 June 2007)

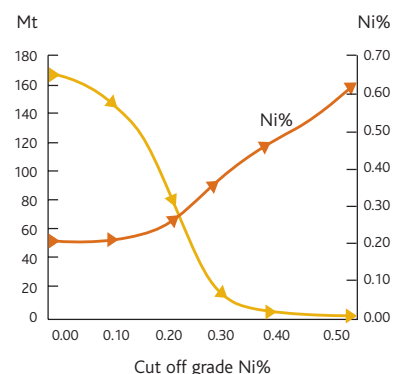
	Measured Mineral Resource					
	Cut-off (Ni%)	Tonnes	Ni%	Cu%	Co%	*4E g/t
<b>Current Mine &amp; Phase 1 Expansion</b>						
MSB – Lens 1, Lens 3 & Mauhorn Lens	0.35	58 000	2.23	1.33	0.11	7.66
BMZ (Underground)	0.35	45 000	0.57	0.36	0.03	1.54
MMZ (Underground)	0.35	1 090 000	0.55	0.20	0.03	1.12
MMZ (Open Pit) Pit 1						
<b>Phase 2 Expansion Project</b>						
MMZ (Underground) (Includes Current Mine)						
MMZ (Open Pit) Pits 2 & 3						
PCMZ (Underground)						
PCMZ (Open Pit) Pits 2&3						
<b>TOTAL 2007 Mineral Resource</b>		<b>1 193 000</b>	<b>0.67</b>	<b>0.30</b>	<b>0.03</b>	<b>1.45</b>
<b>TOTAL 2006 Mineral Resource</b>		<b>1 316 000</b>	<b>1.03</b>	<b>0.49</b>	<b>0.05</b>	<b>3.29</b>

There are five main sulphide zones in the Uitkomst Complex: the MSB, situated at and below the base of the complex, which has been the main producer for the underground mine since 1997; the BMZ within the Basal Gabbro; the MMZ, occurring within the Lower Pyroxenite, which is currently being mined from both underground and open pit; the PCMZ, which occurs with the Chromititic Peridotite (PCR) and is not currently being mined, and the PRDMZ, which occurs in the Peridotite Unit. In addition, the Massive Chromitite Unit (MCHR) is currently being mined where it is fully oxidised (weathered) in the open-pit area. The dominant sulphide minerals are pyrrhotite, pentlandite and chalcopyrite; cobalt is mostly in solid solution in the pentlandite, and the PGMs occur as separate minerals, merenskyite being dominant.

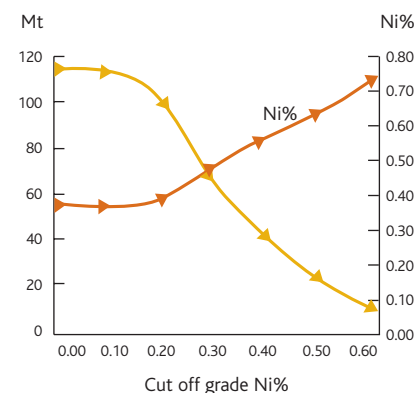
#### MINERAL RESOURCES AND RESERVES

There have been numerous diamond, percussion and RC drilling campaigns since 1972 totalling over 162 000m in more than 1000 boreholes. Consequently, various sampling and assaying protocols as well as varying standards of QA/QC have been used. Core sizes have been mainly NQ and TNW. Before 1990 (Anglo American holes), half core samples over widths ranging from 1m to 5m were taken. Samples were assayed at Anglo American Research Laboratory (AARL) for total nickel, copper and cobalt using AA and for "sulphide" nickel using a peroxide leach/AA finish. Composite samples were assayed for platinum and palladium by Pb-collection fire assay/ICP, S by combustion, and a range of major elements by fusion, and relative density using the Archimedes bath method. Between 1990 and 1997 (Anglovaal holes), assays were carried out at the Anglovaal Research Laboratory (AVRL), with internal standard checks. Nickel analyses were also carried out by the partial digestion methods and comparisons between AARL and AVRL to ensure that the data was compatible. In 2003, a 50m spaced drilling programme was carried out in the shallow open pit area. Samples from this drilling were analysed at AVRL for nickel, copper cobalt using an aqua regia partial extraction/AA finish. Platinum, palladium, rhodium and gold were analysed by Pb-collection fire-assay/AA finish.

GRADE-TONNAGE CURVES  
FOR PCMZ IN PITS 2 & 3 AREA



GRADE-TONNAGE CURVES  
FOR MMZ IN PITS 2 & 3 AREA



Indicated Mineral Resource						Total Mineral Resource				
Cut-off (Ni%)	Tonnes	Ni%	Cu%	Co%	*4E g/t	Tonnes	Ni%	Cu%	Co%	*4E g/t
						58 000	2.23	1.33	0.11	7.66
0.35	229 000	0.47	0.34	0.02	1.20	274 000	0.49	0.34	0.02	1.26
						1 090 000	0.55	0.20	0.03	1.12
0.35	2 413 000	0.49	0.24	0.03	1.21	2 413 000	0.49	0.24	0.03	1.21
0.30	48 602 000	0.48	0.21	0.03	1.03	48 602 000	0.48	0.21	0.03	1.03
0.24	82 641 000	0.43	0.19	0.03	1.08	82 641 000	0.43	0.19	0.03	1.08
0.30	19,946 000	0.38	0.12	0.02	0.77	19 946 000	0.38	0.12	0.02	0.77
0.16	122 697 000	0.23	0.07	0.01	0.71	122 697 000	0.23	0.07	0.01	0.71
	276 528 000	0.35	0.13	0.025	0.84	277 721 000	0.34	0.13	0.02	0.84
	133 329 000	0.46	0.19	0.03	1.06	134 645 000	0.47	0.19	0.03	1.08

\*4E = Pt+Pd+Rh+Au



# ARM Platinum Operations continued

Analyses also included Cr<sub>2</sub>O<sub>3</sub>, MgO, FeO, S and relative density. Duplicates and internal standards were used and a suite of referee samples were analysed at Genalysis Laboratory in Perth. Comparisons indicated good correlations between laboratories. In 2005, it was decided to re-sample many of the Anglo American drill holes to improve the sample density for PGEs in the open pit area. Drill core was re-sampled (quarter core) at 1 metre intervals. Assays were carried out by SGS Laboratory in Johannesburg for Pt, Pd and Au by Pb-collection fire assay/AA and for Ni, Cu and Co by aqua regia leach/AA. Blanks, duplicates and AMIS standards were included. The new data was incorporated into the borehole database.

The MSB Mineral Resources are based on surface and underground diamond drilling and sidewall sampling. Underground holes are spaced 20m apart and the drill core is sampled at 1m intervals. The Nkomati mine laboratory analyses samples for Ni, Cu and Co using aqua regia leach/ICP, while the PGE assays are carried out by SGS Laboratories in Johannesburg. Both laboratories use blanks, standards and check assays for quality control.

The resources for the MMZ and PCMZ are based on surface diamond drilling, mostly at 100 metre spacing, except in the shallow open pit area, where the drill spacing is 50m and occasionally 25m.

## OXIDISED MASSIVE CHROMITITE RESERVE (with depletion by production as at June 2007)

Chromitite	Tonnes	Cr <sub>2</sub> O <sub>3</sub> %
Probable mineral reserve (30% Cr <sub>2</sub> O <sub>3</sub> Cut-off)	6 560 000	31.10

*Due to rounding of figures small discrepancies may exist. A nickel price of US\$16.5/lb and an R\$:US\$ exchange rate of 7.35 for the first three months, 7.45 for the next six months and 7.55 for the last three months have been assumed in estimating the Nkomati Mineral Reserve.*

## 2007 MINERAL RESERVES, NKOMATI MINE & PHASE 2 EXPANSION PROJECT (with depletion by production as at 30 June 2007)

	Proved Mineral Reserve					
	Cut-off (Ni%)	Tonnes	Ni%	Cu%	Co%	*4E g/t
<b>Current Mine / Phase 1 Expansion</b>						
MSB – Lens 1, Lens 3 & Mauhorn Lens	0.35	62 000	1.83	1.00	0.07	6.17
MMZ (Underground)	0.50	330 000	0.59	0.24	0.03	1.25
MMZ (Open Pit) Pit 1						
<b>Phase 2 Expansion Project</b>						
MMZ (Open Pit) Pits 2 & 3						
PCMZ (Open Pit) Pits 2&3						
<b>TOTAL 2007 Mineral Reserve</b>		<b>392 000</b>	<b>0.79</b>	<b>0.36</b>	<b>0.04</b>	<b>2.03</b>
TOTAL 2006 Mineral Reserve		716 000	1.34	0.80	0.06	5.09

Geological wireframe models are generated from the entire borehole database in Datamine but only diamond drill holes are used for the variography and grade estimation by ordinary kriging. Block sizes for the MSB model are 20m x 20m x 1m; for the MMZ and PCMZ, the block size is 50m x 50m x 2.5m except in the shallow open pit area where the block size is 15m x 15m x 10m.

The oxidised chromitite resources are based on separate geological and grade models generated from surface RC and diamond drill holes spaced between 20 and 100m apart. The grade model uses the same 50m by 50m by 2.5m prototype on which the MMZ and PCMZ resources are based. The Measured resource includes the area where 20m spaced drilling was carried out; the Indicated resources are where 50m spaced drilling has been carried out, and the Inferred resources occur where the drill spacing exceeds 50m.

There have been substantial changes in the MSB, MMZ and PCMZ mineral resources from 2006:

- A reduction in total MSB resources from 323 000t to 58 000t due to depletion by production.
- The addition of a separate BMZ resource of 274 000t.

#### HISTORICAL PRODUCTION AT NKOMATI NICKEL MINE

Financial year	Tonnes Ni mined	Tonnes Cr sold
2003	302 000	-
2004	344 000	-
2005	346 000	-
2006	373 000	-
2007	318 000	584 177

Probable Mineral Reserve						Total Mineral Reserve				
Cut-off (Ni%)	Tonnes	Ni%	Cu%	Co%	*4E g/t	Tonnes	Ni%	Cu%	Co%	*4E g/t
						62 000	1.83	1.00	0.07	6.17
0.50	9 846 000	0.55	0.21	0.02	1.04	10 176 000	0.55	0.21	0.02	1.05
0.35	1 500 000	0.58	0.24	0.04	1.29	1 500 000	0.58	0.24	0.04	1.29
0.24	67 900 000	0.42	0.18	0.03	1.03	67 900 000	0.42	0.18	0.03	1.03
0.16	86 230 000	0.22	0.06	0.01	0.62	86 230 000	0.22	0.22	0.01	0.62
	<b>165 476 000</b>	<b>0.32</b>	<b>0.12</b>	<b>0.02</b>	<b>0.82</b>	<b>165 868 000</b>	<b>0.33</b>	<b>0.12</b>	<b>0.02</b>	<b>0.82</b>
	65 579 000	0.48	0.19	0.03	1.12	66 295 000	0.49	0.20	0.03	1.16

\*4E = Pt+Pd+Rh+Au

# ARM Platinum Operations continued

- ▶ A change in the MMZ open pit resource for the Phase 2 expansion from 57 340 000t at 0.48% Ni to 82 641 000t at 0.43% Ni because of the inclusion of pit 2 and the reduction in the cut of grade from 0.30% to 0.24% Ni (see grade tonnage curve).
- ▶ A change in the PCMZ open pit resource from 8 162 000 at 0.40% Ni to 122 697 000t at 0.23% Ni due to the reduction in the cut off grade from 0.30% to 0.16% Ni (see grade tonnage curve). The new cut off grade reflects the improved viability of mining the PCMZ at low grade in the Phase 2 expansion project.
- ▶ An overall change in the combined Mineral resources from 133 329 000 at 0.48% Ni to 276 528 000t at 0.35% Ni due to the decrease in the applied cut-off grade for the MMZ and PCMZ.

Similarly, there have been changes in the mineral reserves since 2006:

- ▶ The MSB reserves have decreased from 448 000 tones to 82 000t due to depletion by mining.
- ▶ The 9 846 000t of underground MMZ, which was part of the expansion project in 2006, has moved to the current mine reserves.
- ▶ In 2006, the MMZ open pit reserve for the mine included both pits 1 and 2. Pit 2 has been moved to the Phase 2 expansion project, so the mine reserve (for pit 1 only) has reduced from 6 060 000 to 1 500 000t at the same cut off grade.
- ▶ The MMZ open pit reserve for the Phase 2 expansion project has increased from 49 612 000 at 0.46% Ni to 67 900 000t at 0.42% Ni because of a reduction in cut-off grade from 0.30% to 0.24% Ni.
- ▶ A PCMZ open pit reserve of 86 230 000t has been included in the Phase 2 expansion project.
- ▶ Because of the decrease in cut-off grade for the open pit MMZ and the addition of the open pit PCMZ, the total reserves have increased from 65 579 000t at 0.48% Ni in 2006 to 165 476 000t at 0.32% Ni in 2007.

Mining operations to date comprise a mechanised underground mining operation which feeds a concentrator for production of two types of concentrate (high-grade concentrate and bulk concentrates) both containing PGMs, nickel, copper and cobalt. Final products are transported to various third parties for toll treatment. Chromite product is sent to Assmang's ferrochrome smelter in Machadodorp and is also sold to local and export markets.

## TWO RIVERS PLATINUM MINE

The Two Rivers Platinum Mine is located within the southern sector of the eastern limb of the Bushveld complex, on the farm Dwarsrivier 372KT. Situated at longitude 30°07'00S and latitude 24° 59'00E, the UG2 and Merensky reefs are present on the farm. The project is a joint venture between ARM (55%) and Impala Platinum Holdings Limited (Implats) (45%).

Exploration, development and production history in the area dates from the early 1920s. During 1929, Lydenburg Platinum Areas Limited started mining activity. No records are available, however. Following the acquisition by Gold Fields Mining and Development Limited, exploration started up again in 1987 and was mainly directed at the Merensky Reef. Assmang acquired the farm in September 1998 primarily to exploit the LG6 Chromitite. During 2001, Avmin acquired the PGE rights on the Dwarsrivier farm from Assmang and targeted the UG2 Reef.

In June 2005, following a full feasibility study and a period of trial underground mining, the joint venture announced the release of a 220 000 ounce-per-year PGM mine. As a result, underground mining continued and concentrator/infrastructure construction was commissioned in July 2006.

### TWO RIVERS PLATINUM MINE: MINERAL RESOURCES UG2 (UG2 + Internal Pyroxenite)

	Mt	Grade						
		Pt g/t	Pd g/t	Rh g/t	Au g/t	(3PGE+Au) g/t	(5PGE+Au) g/t	Pt Moz
Measured	13.68	2.41	1.59	0.50	0.05	4.55	5.44	1.06
Indicated	44.13	2.13	1.25	0.38	0.04	3.80	4.58	3.02
<b>TOTAL</b>	<b>57.81</b>	<b>2.19</b>	<b>1.34</b>	<b>0.41</b>	<b>0.04</b>	<b>3.98</b>	<b>4.79</b>	<b>4.07</b>
Inferred	8.1	2.17	1.29	0.39	0.05	3.90	4.68	0.57
								1.22

3PGE=Pt+Pd+Rh

5PGE=Pt+Pd+Rh+Ir+Ru

6E=5PGE+Au

#### TWO RIVERS PLATINUM MINE: MINERAL RESOURCES MERENSKY REEF

Top zone	Mt	(3PGE+Au) g/t	6E g/t	Pt g/t	Pt Moz	6E Moz
Measured	-	-	-	-	-	-
Indicated	18.7	3.34	3.55	2.06	1.24	2.13
Inferred	3.9	3.16	3.36	1.95	0.24	0.41

#### HISTORICAL PRODUCTION AT TWO RIVERS PLATINUM MINE

Financial year	Mt
2006	1.00
2007	1.28

#### TWO RIVERS PLATINUM MINE: MINERAL RESERVES UG2 (UG2 + Internal Pyroxenite)

	Mt	Grade							
		Pt g/t	Pd g/t	Rh g/t	Au g/t	(3PGE+Au) g/t	(5PGE+Au) g/t	Pt Moz	6E Moz
Stockpile	0.16	1.99	1.32	0.37	0.03	3.72	4.42	0.01	0.02
Proved	10.24	2.03	1.29	0.37	0.04	3.74	4.51	0.67	1.48
Probable	30.19	1.83	1.12	0.36	0.03	3.34	4.01	1.78	3.89
<b>TOTAL</b>	<b>40.59</b>	<b>1.88</b>	<b>1.17</b>	<b>0.36</b>	<b>0.03</b>	<b>3.44</b>	<b>4.13</b>	<b>2.45</b>	<b>5.39</b>

#### MINING AUTHORISATION

Two Rivers holds an old order Mining Licence no. 4/2003 on Portion 6 of Dwarsrivier 372KT relating only to the PGEs and the ores thereof contained in the Merensky and UG2 reefs. An application for a new order conversion of the mining licence was submitted in July 2007, and is under consideration with the DME.

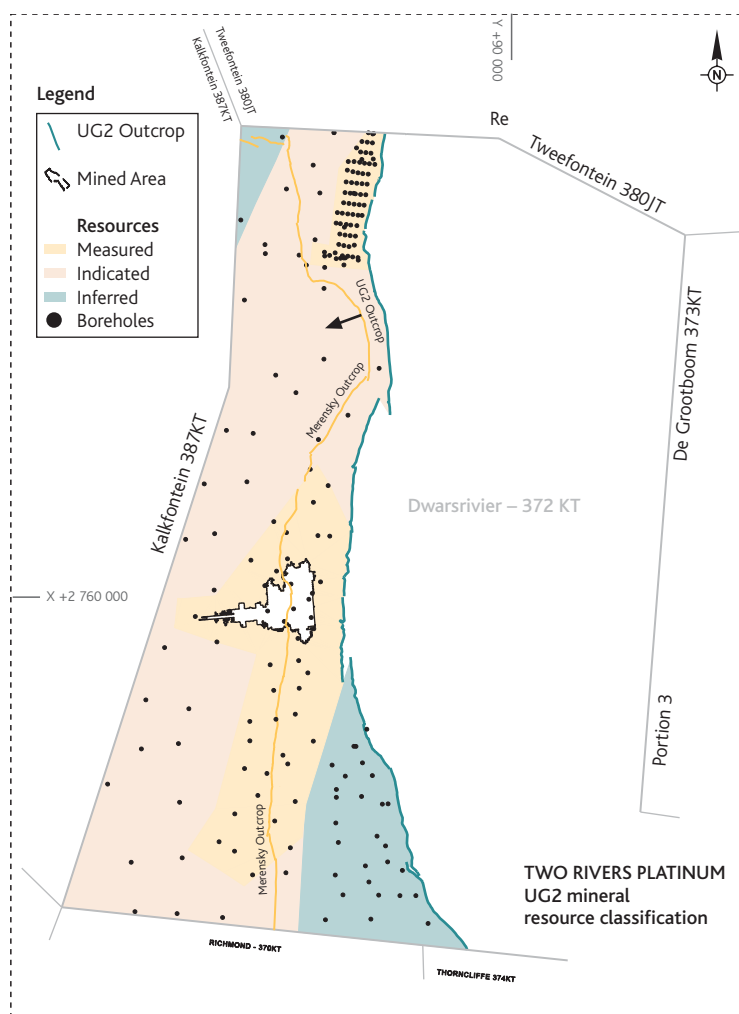
#### GEOLOGY

The UG2 Reef outcrops in the Klein Dwarsrivier valley over a north-south strike length of 7.5km, dipping to the west at between 7° and 10°. The extreme topography results in the UG2 occurring at a depth of 935m on the western boundary.

The following reef facies have been defined for the UG2 at Two Rivers:

- 'Normal' UG2 with an average thickness of 120 centimetres. This is overlain by up to three chromitite 'leaders' collectively termed the UG2A chromitites;
- 'Split Reef' in the southern, west-central and north-eastern parts, characterised by a pyroxenite or norite lens up to 6m thick which is developed within the UG2 and typically resulted in a lower chromitite layer that is thicker than the upper chromitite layer; and
- 'Southern facies' comprising a second pyroxenite/norite lens situated approximately one-third from the base of the UG2. This facies has been intersected in seven drill holes in the extreme south-western area.

The UG2 is usually bottom loaded with peak PGM values occurring in the basal 10cm sample.







# ARM Platinum Operations continued

The Merensky Reef consists mainly of orthopyroxene with lesser amounts of plagioclase and clinopyroxene. Thin chromitite layers, usually 1 to 4mm thick generally, occur near the upper and lower contacts of the reef.

## RESOURCES/RESERVES

The majority of resources at Two Rivers are classified as Indicated Mineral Resources, and it is only the open-pit area in the north and the area around the underground mine that are classified as Measured Resources due to the more closely spaced drilling in this area.

A total of 218 surface diamond boreholes had intersected the UG2, of which 35 were drilled by Gold Fields of South Africa and 18 by Assmang. This provided a total of 409 individual UG2 reef intersections, with an average spacing grid of 500m over the whole property and 250m grid spacing over the area planned for the first five years of mining. The drill hole spacing in the area of the open pit is 50m on dip and 100m on strike. It was standard for Two Rivers to drill three non-directional deflections off each mother hole.

The holes were halved by diamond saw and the half-core sampled at 20cm. Samples were crushed and split and submitted for assaying. All samples were assayed by Ni-sulphide collection fire-assay with an ICP-MS finish to determine Pt, Pd, Rh, Ru, iridium (Ir) and Au values. Base metals (Ni, Cu, Co) were also assayed by aqua regia digestion/OES finish. Duplicate samples and check analyses were carried out. The earlier Gold Fields and Assmang samples were assayed by Pb-collector fire-assay with gravimetric finish. In order to combine the data, some of the original core samples were re-assayed by means of Ni-sulphide collection fire-assay and a regression equation was derived at to re-cast the original Pb-collection data as Ni-sulphide assay 'equivalents'. The Merensky Reef resource is based on a total of 81 surface diamond drill holes. The same sampling protocol was used as for the UG2, but assays were carried out by Pb-collection fire-assay with ICP-MS finish for Pt, Pd Rh and Au.

Ordinary Kriging interpolation within Datamine was used to estimate the grade of each 50 x 50 x 1m block generated within the geological model. The UG2 was wireframed and estimated as two units based on the Pt:Pd ratio as observed in the drill hole database. Sub-cell splitting of blocks was allowed to follow the geological boundaries accurately. Relative density was calculated for each sample and determined by Kriging in the resource model.

Total in-situ resources were decreased by 30% to account for geological losses due to potholes, faults, dykes and replacement pegmatoids.

The resource to reserve conversion was done using the Mine2-4D optimisation software package to select the optimum economic cut subject to the geological, geotechnical and trackless mining constraints. Unplanned and off-reef dilution factors, followed by a 95% mine call factor, have been applied to the output from the optimiser to provide the fully diluted mill head grade of the reserves.

Overall the 2007 UG2 Resources decreased from 59.3Mt to 57.8Mt. This 1.5Mt reduction is the result of depletion by mining and some Indicated resources were moved to the Inferred category.

The Measured Resources were increased by 0.6mt when compared to the previous year. This was due to a change in the area assigned to this resource, to better represent the close spaced drilling grid. The PGE grades however decreased as more internal pyroxenite is now included in the resource. The Measured resources also increased in the North open pit area as additional drilling in the North decline improved confidence and resources moved from the Indicated to the Measured category. Most of the gain was however off-set by the annual production of 1.15Mt.

The Indicated Resources decreased by 2.1Mt, this is due to the re-arrangement of the Measured area. Faulting in a portion of ground in the North-western corner of the property made the mining of this block uneconomic, and these resources were moved into the Inferred category.

The Inferred Resources grew from zero to 8.1Mt. This is due to the uneconomic faulted block being added and the South open pit which was previously excluded from the resources due to infrastructure such as roads, power lines and a storage dam.

The Mine2-4D model was re-visited and simplified, this exercise increased the Ore Reserves by 0.3Mt from 40.3 to 40.6Mt. The 1Mt reserve on the stockpile was drawn down to 0.16Mt as it was fed to the plant.

### THE MODIKWA PLATINUM MINE

The Modikwa platinum underground mine is situated some 15km north of Burgersfort and 15km east of Steelpoort, along the border between the Mpumalanga and Limpopo provinces in South Africa. Located at longitude 30°10'S and latitude 24°40'E, the site is accessed via the R37 road between Polokwane and Burgersfort.

Exploration in the area started in the mid 1920s with the discovery of the Merensky Reef. During the late 1980s further drilling was completed on the UG2 and Merensky reefs. In the late 1990s a feasibility study was completed on the exploitation of the UG2. During 2001 a 50:50 JV agreement was signed between Rustenburg Platinum Mines and ARM Mining Consortium Limited. ARM's effective stake in Modikwa is 41.5%, through its 83% ownership of the ARM Mining Consortium. The other 8.5% is held by the Mampudima and Matimatjatji community companies through their 17% shareholding in the ARM Mining Consortium.

### MINING AUTHORISATION

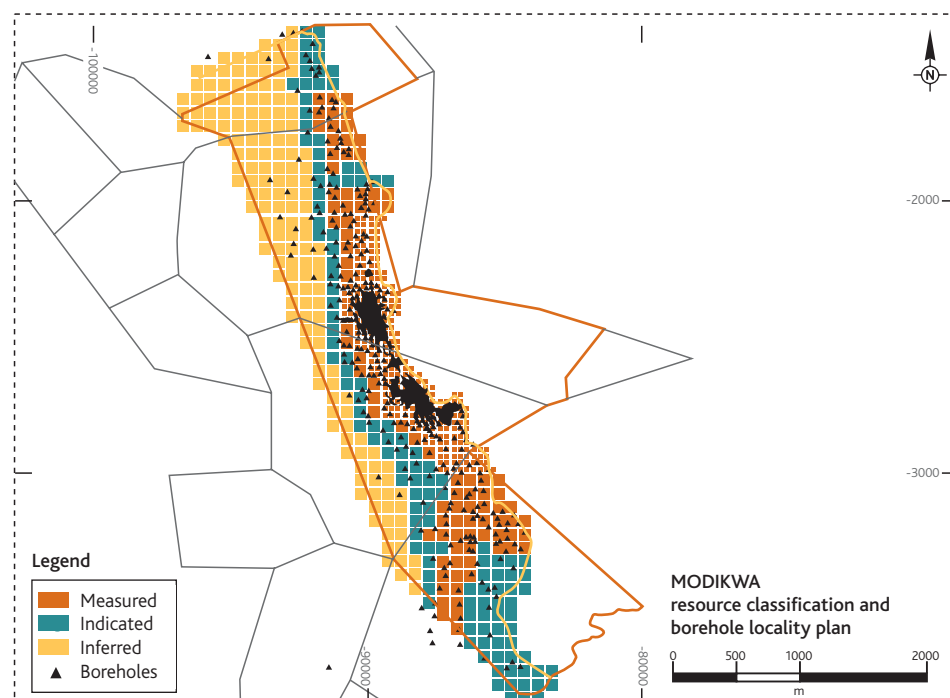
During June 2001, an old order mining licence (No9/2001) was issued to ARM Mining Consortium and Rustenburg Platinum Mines over the properties Onverwacht 292KT, Portion 1 and R/E Winterveldt 293KT, Driekop 253KT, Maandagshoek 254KT and Hendriksplaats 281KT. Application for new order rights is being prepared.

### GEOLOGY

The igneous layering at Modikwa mine is north-northwest striking with an average dip of 10° to the west. Both the UG2 and Merensky reefs are present. The UG2 occurs as a chromitite layer with average thickness of approximately 60cm. Three leader chromitites occur above the main seam. Gentle undulations of the UG2 with amplitudes of less than 2m are pervasively developed across the mine area. Potholes of varying size appear to be randomly distributed within the North shaft area. Potholes are less abundant in the South shaft area, which is more disturbed by faulting. The Onverwacht Hill area is characterised by the presence of several large ultramafic pegmatoid intrusions that disrupt and locally replace the UG2.

### RESOURCES AND RESERVES

The Mineral Resource and Reserve classification is based primarily on the proximity to drilling and underground sampling data and uses the semivariogram range, and the number of samples used, to estimate a block to determine the category. Measured Mineral Resources are classified if a block is within 66% of the range of the semivariogram from the nearest sample and six to 30 samples are used in the estimation process. Indicated



# ARM Platinum Operations continued

Mineral Resources are classified when a block is within the range of the semivariogram and 10 to 30 samples are used in the estimation process. Inferred Mineral Resources are classified if a block falls outside the range of the semivariogram and 30 to 100 samples are used to estimate a block.

The Mineral Resource is based on over 1 100 surface diamond drill holes and over 1 500 underground channel samples. These logs and values are kept in separate electronic databases and combined for estimation purposes after rigorous data validation. The 4E grades are capped at 13g/t based on statistical analyses.

Samples are submitted to Anglo Platinum Research Centre and analysed at Anglo American Research Laboratories. Analyses are completed using two fire-assay techniques to provide individual assay grades for Pt, Pd, Rh and Au, while wet-chemical techniques are used to determine Ni and Cu grades.

The UG2 mining cut is divided into three units comprising the UG2 chromitite layer, the hangingwall and the footwall. Estimation of the three sub-units in the mining cut is carried out separately and independently. Two-dimensional block models with block sizes of 250 x 250m and 500 x 500m, depending on the drill hole spacing, are created. Pt, Pd, Rh, Au, Ni and Cu grades are interpolated using Ordinary Kriging for the UG2 and inverse distance squared for the hanging and footwall units. The width of the chromitite and the density are also interpolated into the block models. The average density at Modikwa mine is 3.92t/m<sup>3</sup>. Discount factors are applied to tonnages ranging from 10% (for Measured Mineral Resources) and up to 30% to account for loss of ore due to pegmatoidal intrusions, faults, dykes and potholes.

The Mineral Reserves at Modikwa increased to 35.2Mt (15.7Mt) when compared with the 2006 statement. The Measured and Indicated Mineral Resources increased from 130.6 to 131.2Mt due to additional drilling and re-evaluation. Resources and Reserves were adjusted to reflect June 2007 status.

A minimum mining cut of 102cm is used to calculate the amount of footwall waste that is included in the mining cut. Where the hangingwall and the main seam thickness are greater than 103cm, an additional 5cm of footwall waste is included. The basal contact of the UG2 layer is typically high-grade and it is important that this contact is not left in the footwall during mining. The UG2 is accessed via two primary declines from surface – and a fleet of mechanised equipment is used for the mining operations. Run-of-mine tonnage is processed at the Modikwa concentrator and the PGE rich concentrate is transported to Anglo Platinum's Polokwane smelter and refining facilities.

## MINERAL RESOURCES / RESERVES UG2

Resources	Mt	3PGE+Au g/t	M oz	Reserves	Mt	3PGE+Au g/t	Moz
Measured	68.5	5.65	12.4	Proved	11.99	4.7	1.81
Indicated	62.7	5.58	11.3	Probable	23.18	4.88	3.64
Total Measured and Indicated	131.2	5.62	23.7	Total	35.17	4.82	5.45
Inferred	96.1	5.87	18.1				

3PGE=Pt+Pd+Rh

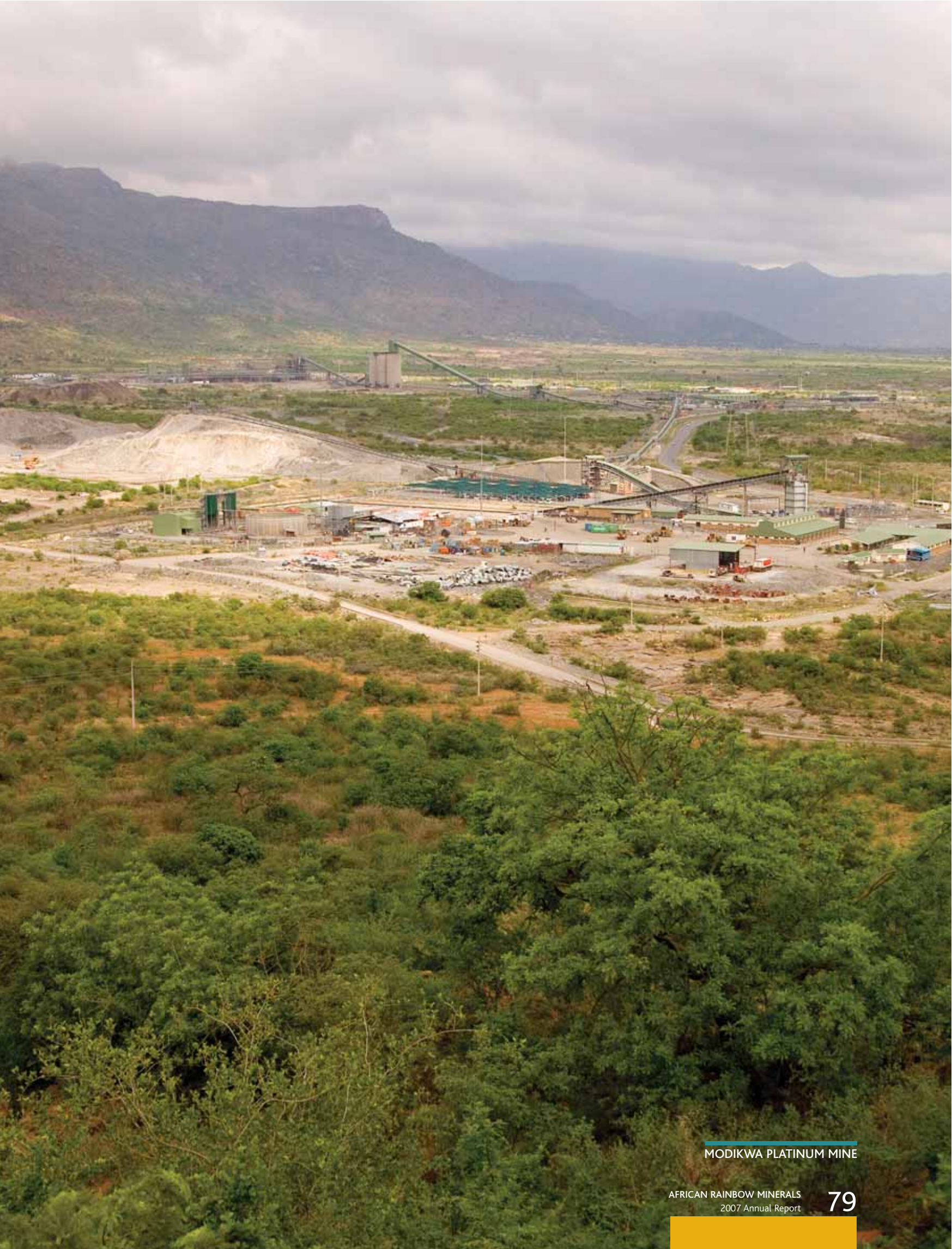
## MINERAL RESOURCES MERENSKY REEF

	Mt	(3PGE+Au) g/t	6E Moz
Measured	18.7	2.96	1.78
Indicated	46.8	2.55	3.84
Inferred	152.0	2.8	13.69

## HISTORICAL PRODUCTION AT MODIKWA PLATINUM MINE

Financial year	Mt
2003	2.08
2004	2.54
2005	2.46
2006	2.51
2007	2.32





MODIKWA PLATINUM MINE



# ARM Platinum Operations continued

## KALPLATS PLATINUM PROJECTS

The Kalplats platinum projects are situated 330km west of Johannesburg and some 90km southwest of Mafikeng in the North West Province of South Africa. Situated at latitude 26°30'S and longitude 24°50'E, the project area is accessed from Stella on the N14 national road linking Mafikeng and Vryburg. Anglo American discovered the Kalplats platinum deposits in the early 1990's and Harmony Gold Mining Company Limited acquired the project from Anglo in 1999. Subsequently ARM acquired the project as part of the merger of the Anglovaal, ARM and Harmony assets in 2004. Pre-2004, exploration comprised a combination of rotary air blast (RAB), reverse circulation (RC) and diamond drilling. Anglo drilled a total of 6 000m in 133 holes, while Harmony drilled a total of 40 000m in 862 holes. Harmony commissioned a feasibility study in 2003 and excavated a 500t bulk sample for metallurgical test work. The study assessed the viability of both an open pit and underground mining operation. The feasibility study was completed early in 2004.

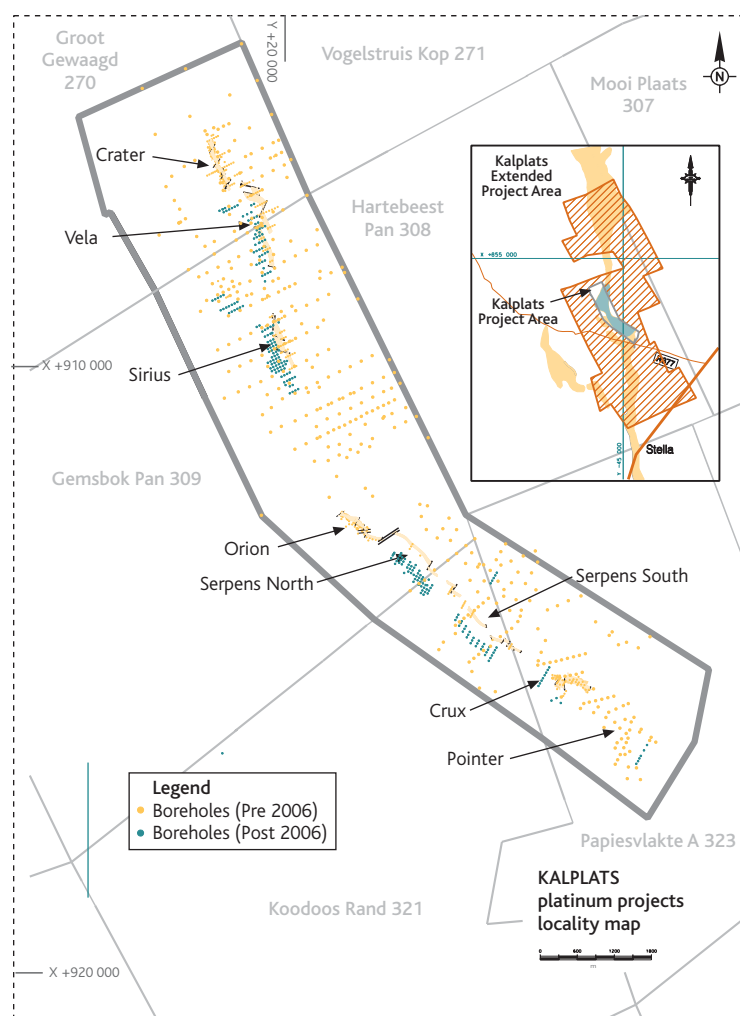
In 2005, ARM Platinum entered into two joint venture agreements with Platinum Australia Limited (PLA), one over the "Kalplats Project" in which ARM Platinum has a 90% share and which provides for PLA to earn up to 49% by completing a bankable feasibility study and making the Panton metallurgical process available at no cost. The other joint venture agreement covers the "Kalplats Extended Project" (Extended Project) in which ARM Platinum and PLA each has a 50% share and contributes equally to the exploration expenditure. Both projects are managed by PLA.

## PROSPECTING RIGHTS

In September 2006, ARM Platinum was granted a new order prospecting right (PR492 of 2006) over the Kalplats Project covering portions of the farms Groot Gewaagd 270, Gemsbok Pan 309, Koodoos Rand 321 and Papiesvlakte 323 (approximately 3 810 ha). In April 2007, a new order prospecting right (DME1056) (approximately 62 985 ha) was granted to ARM Platinum over the Extended Project area which covers an additional 20km of strike to the north and 18km to the south of the Kalplats Project area.

KALPLATS – MINERAL RESOURCES			
	Tonnes Mt	2 PGM+Au g/t	Moz
Measured	-	-	-
Indicated	7.12	1.7	0.38
Inferred	68.11	1.15	2.44

2PGM=Pt+Pd



## **GEOLOGY**

PGE mineralisation is hosted mainly by magnetite-rich gabbros within the Stella Layered Intrusion (SLI), a 3.0bn year old layered complex intruded into the Kraaipan Greenstone Belt. mineralisation is contained in seven separate, subvertically dipping zones known as Crater, Orion, Vela, Sirius, Crux, Serpens North and Serpens South, each with strike lengths of between approximately 500 and 1 000m and widths of between 15 and 45m. Three main sub-parallel reef packages within each zone have been recognised. They are the Main Reef (the highest grade reef), Mid Reef and LG Reef. The area is structurally complex, and thrusting has caused duplication of reefs in some cases.

## **MINERAL RESOURCES AND RESERVES**

Since September 2006, when PLA started work on the Kalplats Project, almost 28 000m of diamond and RC drilling have been completed. An aeromagnetic survey was also carried out over the whole of the Kalplats Project area as well as part of the southern Extended Project area covering approximately 5.5km of strike length. Drilling has focused on extending the known mineralisation at Serpens North and South, Crux and the gap between Crux and Serpens South, Scorpio, Sirius, and to a lesser extent, Crater. Results to date have been positive and encouraging, but PLA has not yet updated the geological models and carried out a newer resource estimation. Consequently, the 2007 mineral resource statement for the Kalplats project remains the same as previous years and which are derived from the 2004 Harmony feasibility study.

Due to the complex nature of the structure and global estimation techniques no Measured Mineral Resources have been defined. At the Crater and Orion deposits the Indicated and Inferred Mineral Resource boundaries were defined based on the proximity of the deepest borehole in the structural block.

For the Crater and Orion deposits the mineral resource is based on RC and surface diamond drill holes on a grid with drill holes spaced at approximately 25m intervals, increasing to 50m at the margins of the mineralisation. For the other five deposits the hole spacing is wider, varying from 50 to 200m.

A 15% metal discount was applied to all resource blocks to account for barren dykes, which are modelled within the ore blocks and would have to be mined as ore, but contain no grade.





TRANSPORTING COAL



# ARM Coal

## GOEDGEVONDEN COAL PROJECT

During 2006, ARM Coal was formed as an equity partner for Xstrata South Africa (Xstrata SA). ARM Coal holds a 20% equity-based participation in Xstrata SA's coal operations as well as 51% of the Goedgevonden JV. The ARM board has approved the exercise of an option held by ARM to acquire a further 10% in Xstrata's South African coal operations, directly, for R400m as from 1 September 2006. Xstrata SA is the third largest exporter of thermal coal and produces about 20% of all thermal coal exported from South Africa. Currently it has interests in 13 mines, most of which are located within the two major coalfields, Witbank and Ermelo. The annual sales of Xstrata SA is in excess of 20Mt of thermal coal.

The Goedgevonden project is situated in the Witbank Coalfield about 7km south of the town of Ogies in Mpumalanga province in South Africa. Snowden (in October, 2005) audited a feasibility study carried out by Murray and Roberts in September 2005, and ARM expects the work carried out by these two organisations to be accurate and manifesting a high degree of confidence. No additional work on resources and reserves was carried out by ARM.

The stratigraphy of the Witbank Coalfield consists of five seams numbered from oldest to youngest: No 5 to No 1 seam. The seams vary in thickness from less than 0.5m to over 6m and do not exceed 300m in depth from

surface. The coal seams dip at less than 5°. However, coal seam morphology and qualities may be locally influenced by basement topography, surface weathering and intrusion of dolerite dykes and sills. The coal qualities vary both within and between individual coal seams. Low quality coals, suitable for the local steam coal market, have a calorific value of between 18 to 22Mj/kg, whereas the high quality export steam coal has a calorific value of greater than 27Mj/kg. The proposed Goedgevonden open-cut mine is expected to produce about 3.2m additional tonnes annually for export and 3.4Mt a year for domestic thermal generation coal by 2009. The planned stripping ratio is between 3.35:1 and 1.85:1 in the early years of production. Using a mining contractor, Xstrata SA started mining on the Goedgevonden property at a rate of 1Mt a year (run-of-mine), gaining knowledge of the geology and mining conditions.

All five coal seams are developed on Goedgevonden. The No 1 seam is of low quality, thin and only developed in paleo-low areas. The No 2 seam is extensively developed and is of good quality and is, on average, 5.5m thick. The No 3 seam at Goedgevonden is of good quality but, with an average thickness of only 0.3m, is uneconomic. The No 4 seam, being closer to surface and although of the same thickness as the No 2 seam, is influenced by weathering and is not as extensively developed. The No 5 seam

is of good quality, but is preserved as erosional remnants on the high ground only and thus not extensively developed over the area. No major faults, structural disturbances or intrusives were observed in the boreholes drilled to date.

A total of 548 surface diamond boreholes were drilled during 1964 to 2004 by Duiker Mining and Xstrata SA. Anglo Coal supplied an additional 102 boreholes for the Zaaiwater area. Most boreholes were drilled down to basement to define the seam locality and basement topography. Owing to the different campaigns, the database had to be validated to produce a consistent set of data.

Wireframes for the seam composites for the No 2, 4 and 5 seams were generated in Datamine. Two-dimensional blockmodels were generated with block sizes of 50 x 50m. All estimations of the individual blocks were done using inverse distance cubed with an isotropic search. Other software packages used in the evaluation are 'Washproduct' and 'Xpac'.

The following table with regard to Goedgevonden resources and reserves was obtained from Snowden, reflecting the status as at June 2005.

Mineral Resources and Reserves of the Xstrata mines are the responsibility of the Xstrata SA resources and reserves team. No ARM employee is involved in the compilation of Xstrata SA's Mineral Resources and Reserves.

## XSTRATA – MINERAL RESOURCES AND RESERVES

Measured and Indicated Resources	Proved and Probable Reserves	Sales Reserves
570MT	357.4MT	194.1MT

# Competence



GOEDGEVONDEN COAL PROJECT

## COMPETENCE

The competent person with overall responsibility for the compilation of the Mineral Reserves and Resources is Paul J van der Merwe, PrSciNat, an ARM employee. He consents to the inclusion in this report of the mineral resources based on current information in the form and context in which it appears.

Paul van der Merwe graduated with a BSc (Hons) in Geology from Free State University. He spent four years as an exploration geologist for FOSKOR. He then joined the Uranium Resource Evaluation Group of the then Atomic Energy Corporation of South Africa for 12 years. While employed there he studied geostatistics and spent some time at the University of Montreal, Canada. In 1991 he joined Anglovaal Mining (now ARM) in the Geostatistics Department and evaluated numerous mineral deposit types for this group in Africa. In 2001 he was appointed as Mineral Resource Manager for the group. He is registered by the South African Council for Natural Scientific Professions as a Professional Natural Scientist in the field of practice of Geological Science, Registration Number 400498/83, and as such is considered to be a Competent Person.

All competent persons at the operations have sufficient relevant experience in the type of deposit and in the activity for which they have taken responsibility. Details of the ARM's competent persons are available from the company secretary on written request.

The following competent persons were involved in the calculation of Mineral Resources and Reserves. They are employed by ARM or its subsidiaries and joint venture (JV) partners:

## RESOURCES AND RESERVES

M Burger/S v Niekerk, PrSciNat	Iron
M Burger, PrSciNat	Chrome
A Pretorius*, PrSciNat	Manganese
M Davidson, PrSciNat	Nickel
H Vermeulen	Nickel
J Vieler*, PrSciNat	Nickel
J Woolfe, PrSciNat	Nickel/Platinum
B Knell*, PrSciNat	Platinum
R van Rhyn, PrSciNat	Platinum
C Schlegel, PrSciNat	Gold/Copper
T Williams*, PrSciNat	Copper

\* external consultant



# Definitions

The definitions of resources and reserves, quoted from the SAMREC CODE, are as follows:

A '**mineral resource**' is a concentration [or occurrence] of material of economic interest in or on the earth's crust in such form, quality or quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a mineral resource are known, estimated from specific geological evidence and knowledge, or interpreted from a well constrained and portrayed geological model. Mineral Resources are subdivided, in order of increasing confidence in respect of geoscientific evidence, into inferred, indicated and measured categories.

An '**inferred mineral resource**' is that part of a mineral resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that may be limited or of uncertain quality and reliability.

An '**indicated mineral resource**' is that part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed.

A '**measured mineral resource**' is that part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity.

A '**mineral reserve**' is the economically mineable material derived from a measured and/or indicated mineral resource. It is inclusive of diluting materials and allows for losses that may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is reasonably justified. Mineral Reserves are sub-divided in order of increasing confidence into probable Mineral Reserves and proved Mineral Reserves.

A '**probable mineral reserve**' is the economically mineable material derived from a measured and/or indicated mineral resource. It is estimated with a lower level of confidence than a proved mineral resource. It is inclusive of diluting materials and allows for losses that may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is reasonably justified.

A '**proved mineral reserve**' is the economically mineable material derived from a measured mineral resource. It is estimated with a high level of confidence. It is inclusive of diluting materials and allows for losses that may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is reasonably justified.

P J van der Merwe

27 August 2007