

**INDEPENDENT QUALIFIED PERSON'S REPORT  
BLANKET MINE,  
ZIMBABWE**

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### 3 SUMMARY

Applied Geology Services cc (AG) has been commissioned by Caledonia Mining Corporation (Caledonia) to prepare an Independent Qualified Persons Report on the Blanket Mine, Zimbabwe. On the 20<sup>th</sup> June 2006 Caledonia Mining Corporation (Caledonia) announced that it had acquired the Blanket Gold Mine, near Gwanda in Zimbabwe, from Kinross Gold Corporation of Canada. This transaction, because it represents a significant addition to the assets of Caledonia, requires the preparation and posting of an Independent Technical Report.

The Blanket Mine, which was discovered at the turn of the century, consists of underground mining and processing of several closely-spaced deposits defining a mineralised trend. Major infrastructure consists of underground workings, a process plant and a tailings dam. To date the mine has a recorded production of 1,004,000 oz of Au at an average grade of 4.79 g/t Au. Current reserves and resources are summarised in the table below:

#### Summary of Mineral Resources and Mineral Reserves, Blanket Mine, 30<sup>th</sup> June 2006

##### MINERAL RESERVES (@Au price US\$500/oz)

Classification	Tonnes	Grade Au g/t	Content (kg)	Content (oz)
<b>PROVEN ORE</b>				
Operating Areas	917,200	3.96	3,628	116,640
Pillars (discounted by 50%)	247,600	4.59	1,137	36,560
Blanket Tailings	145,600	1.63	237	7,620
Total Proven Ore including Pillars	1,310,400	3.82	5,002	160,820
<b>PROBABLE ORE</b>				
Operating and Development Areas	2,326,000	4.10	9,540	306,700
<b>Total Proven + Probable Ore</b>	<b>3,636,400</b>	<b>4.00</b>	<b>14,542</b>	<b>467,500</b>

**Note:** For Proven ore, tonnages are rounded to nearest 100 and ounces to nearest 10; for Probable ore, tonnages are rounded to the nearest 1000, ounces to the nearest 100 and kilograms to the nearest 10.

##### MINERAL RESOURCES (@Au price US\$500/oz)

Classification	Tonnes	Grade Au g/t	Content (kg)	Content (oz)
<b>Indicated</b>	380,000	4.12	1,600	51,000
<b>Inferred</b>	2,400,000	5.91	**	**

**Notes:** Indicated Resource tonnages have been rounded to the nearest 10 000, ounces to the nearest 1000 and kilograms to the nearest 100; Inferred resource tonnages have been rounded to the nearest 100 000:

\*\* - In keeping with the requirements of NI 43-101, Inferred Resources are reported without estimates of metal quantities.

The Blanket Mine exploits a fairly typical Archaean greenstone-hosted deposit situated on the northwest limb of the Gwanda Greenstone belt. Active mining at Blanket covers a 3 km span and includes the Jethro deposits in the south, through Blanket itself to the Feudal, AR South, AR Main, Sheet, Eroica and Lima deposits in the north.

Two main types of mineralisation are recognised:

- a disseminated sulphide replacement type, which comprises the bulk of the ore shoots
- quartz veins that tend to have long strikes but are not uniformly mineralised.

Three types of mining methods are used at the Blanket Mine:

- Underhand stoping in the narrow ore bodies
- Shrinkage stoping where blocky sidewalls are evident
- Longhole stoping in the wider ore bodies, using 15 m sub-levels.

The different rock types at the Blanket Mine are generally very competent and support such as rock bolts are only installed on rare occasions where weak rock conditions are encountered.

The ROM process consists of three-stage crushing, a rod mill, Knelson Concentrators, and a CIL (carbon-in-leach) circuit. Loaded carbon is eluted and electro-won in a compact PG Elution cell. Cathodes from the cell are acid digested and calcined before smelting on site. Tailings from the CIL stream is pumped to a tailings dam, with the effluent recycled to the plant.

The Zimbabwean Government recently enacted new regulations covering water and effluent disposal. Under these regulations the mine is required to obtain permits for all effluent disposal and two permits have been issued to the Blanket Mine covering the sewage effluent and mill tailings disposals. The Mine has also implemented a pollution monitoring system around the current tailings dam with the installation of a number of piezometers, which are routinely monitored on an independent basis by SRK personnel from the Harare office.

In terms of the Mining General Regulations, certain closure obligations are to be fulfilled and these are currently covered in a Closure Plan prepared by Knight Piesold.

The Blanket Mine smelt their gold twice a month and deliver it to the Refinery, which is operated by the Reserve Bank of Zimbabwe. Imported spares and consumables are purchased with the approval of the Chamber of Mines and Reserve Bank.

Production scheduling from the Blanket Mine LoM Plan was used as the basis for input to the financial model prepared by AG and presented in Table II. The following assumptions were used for the financial model:

- All prices are as at 30<sup>th</sup> June 2006;
- A gold price of US\$500/oz has been used for all gold revenue;

- Unit costs are based on the June 2006 Income Statement that includes the revenue and operating costs for June and for the year-to-date from January 2006;
- The financial model was calculated in US\$;
- Capital expenditure of US\$1.9 million is included as per the LoM plan. After that the capital expenditure allows for ongoing capital at 10% of the operating cost per year. The capital expenditure was considered as a deduction for tax purposes
- A closure cost of US\$1.2 million is provided for by the salvage value of the mine once it closes
- The rate used for income tax is 30% based on the corporate rate of 15% plus import duties
- The financial model has not taken any extra income, depreciation, levies or interest payable into account.

#### **Blanket Mine Financial Model Generated By AG**

	<b>Total Production 2006 to 2011</b>
Total Underground Production	3,776,000 t @ 4.05 g/t Au
ROM tonnes per day	920
Mill Recovery	90.0%
Total Recovered - kg Au	13,756
Total Recovered - oz Au	442,300
Revenue at US\$500/oz	221,135,000
Working Costs US\$	124,115,000
Working Costs US\$/tonne (June,2006)	32.61
Services and Admin US\$	16,300,000
Total Operating Costs US\$	140,415,000
Operating Profit/Loss US\$	80,720,000
Capital Expenditures US\$	12,904,000
Earnings Subject to Tax US\$	67,816,000
Taxes @ 30% US\$	17,849,000
Earnings After Tax US\$	49,987,000
NPV @ 15% US\$	21,711,000

Based on the Mineral Reserves and Indicated Resources as at 30<sup>th</sup> June 2006, Blanket Mine has a life of 11 years. Given the fact that Blanket's declared Inferred Mineral

Resources have the potential to add significantly to the current mine life, it is essential that the LoM Plan be re-evaluated, and that priority areas be identified for infill drilling and mine planning in an effort to upgrade the classification of the resources and hence the mine life. It is also important to note that the above estimates of inferred resources are conservative and that there are numerous opportunities to define additions to the existing ore shoots.



## **4 INTRODUCTION AND TERMS OF REFERENCE**

On the 20<sup>th</sup> June 2006 Caledonia Mining Corporation (Caledonia) announced that it had acquired the Blanket Gold Mine, near Gwanda in Zimbabwe, from Kinross Gold Corporation of Canada. This transaction, because it represents a significant addition to the assets of Caledonia, requires the preparation and posting of an Independent Technical Report.

Applied Geology Services cc (AG) has been commissioned by Caledonia Mining Corporation (Caledonia) to prepare an Independent Qualified Persons Report on the Blanket Mine, Zimbabwe. This report is prepared to comply with disclosure and reporting requirements set forth in Canadian National Instrument 43-101, Companion Policy 43-101CP, and Form 43-101F1.

The report complies with Canadian National Instrument 43-101, for the ‘Standards of Disclosure for Mineral Projects’ of February 2001 (the Instrument). This report has also been prepared in accordance with the ‘Code and Guidelines for Assessment and Valuation of Mineral Assets and Mineral Securities for Independent Expert Reports’ of 1998 (the Valmin Code) as accepted by the South African Institute of Mining and Metallurgy (SAIMM). In case of conflict, Instrument 43-101 applies.

### **4.1 Scope of the Report**

The scope work undertaken by AG involved an assessment of the following aspects of the Blanket Mine:

- Geology
- Exploration and Valuation Techniques
- Mineral Resources
- Conversion of Mineral Resources to Mineral Reserves
- Life of Mine Plan
- Metallurgy and Processing Plant
- Mine Residue Deposits
- Environmental Issues and Compliance
- Infrastructure and Capital Expenditure Requirements
- Economic Analysis using Cash Flow Modelling

### **4.2 Principal Sources of Information**

In addition to a site visit undertaken to the Blanket Mine in July of 2006 the author of this report has relied extensively on information provided by Blanket Mine including technical reports, press releases and stock exchange announcements. This information is complimented by discussions with Blanket Mine management. A listing of the principal sources of information is included in Section 23 of this report.

Given the extensive operating history of the Blanket Mine, including geological investigations, reconciliation studies, independent check assays and independent

audits, AG has not found it necessary to independently sample and assay portions of the deposit.

Applied Geology Services cc has made reasonable enquiries to establish the completeness and authenticity of the information provided and identified.

### **4.3 Qualifications and Experience**

The primary author of this report is Mr David Grant, who is a professional geologist with 27 years experience in the mining and exploration industries including exploration and evaluation of mineral properties. He is registered as a Professional Earth Scientist with the South African Council of Natural Science, a Fellow of the Geological Society of South Africa, a Fellow of the South African Institute of Mining and Metallurgy, a Fellow of the Geological Society of London and verified by this institution as a Chartered Geologist. The author is the Principal of AG, and has the appropriate relevant qualifications, experience and independence to be considered a Qualified Person as defined in Canadian National Instrument 43-101.

### **4.4 Independence**

Neither Applied Geology Services cc, nor the author of this report, have or have had previously any material interest in Blanket Mine or related entities. My relationship with Caledonia is solely one of professional association between client and independent consultant. This report is prepared in return for fees based upon agreed commercial rates and the payment of these fees is in no way contingent upon the results expressed in this report.

## **5 DISCLAIMER**

This document contains certain statements that involve a number of risks and uncertainties. There can be no assurance that such statements will prove to be accurate; actual results and future events could differ materially from those anticipated in such statements.

The author of this report is not qualified to provide extensive comment on legal issues associated with the Blanket Mine included in Section 6 of this report. Assessment of these aspects has relied on information provided by Caledonia Mining Corporation and has not been independently verified by Applied Geology Services cc.

No warranty or guarantee, be it express or implied, is made by Applied Geology Services cc with respect to the completeness or accuracy of the legal aspects of this document. Applied Geology Services cc does not undertake or accept any responsibility or liability in any way whatsoever to any person or entity in respect of these parts of this document, or any errors in or omissions from it, whether arising from negligence or any other basis in law whatsoever.

The United States Securities and Exchange Commission (the “SEC”) permits mining companies, in their filings with the SEC, to disclose only those mineral deposits that a company can economically and legally extract or exploit. Certain items are used in this report, such as “resources,” that the SEC guidelines strictly prohibit companies from including in filings with the SEC.

Ore reserve estimates are based on many factors, including, in this case, data with respect to drilling and sampling. Ore reserves are determined from estimates of future production costs, future capital expenditures, future product prices and the exchange rate between the Zimbabwe Dollar (“Z\$”) and the United States Dollar (“US\$”). The reserve estimates contained in this report should not be interpreted as assurances of the economic life of the Mining Asset or the future profitability of operations. Because ore reserves are only estimates based on the factors described herein, in the future these ore reserve estimates may need to be revised. For example, if production costs decrease or product prices increase, a portion of the resources may become economical to recover, and would result in higher estimated reserves.

The LoM Plan and the technical economic projection include forward-looking statements that are not historical facts and are required in accordance with the reporting requirements of the Ontario Securities Commission (OSC). These forward-looking statements are estimates and involve a number of risks and uncertainties that could cause actual results to differ materially.

In compliance with National Instrument 43-101, the Qualified Persons that made a personal inspection of the Blanket Mine during the period March-July 2006 are Mr David Grant of AG and Dr Trevor Pearton, a mining geologist and director of Caledonia group companies. Ore resource and reserve computations at Blanket Mine are carried out under the instruction and guidance of Mr Gunn Ndebele, Geological Manager of Blanket Mine.



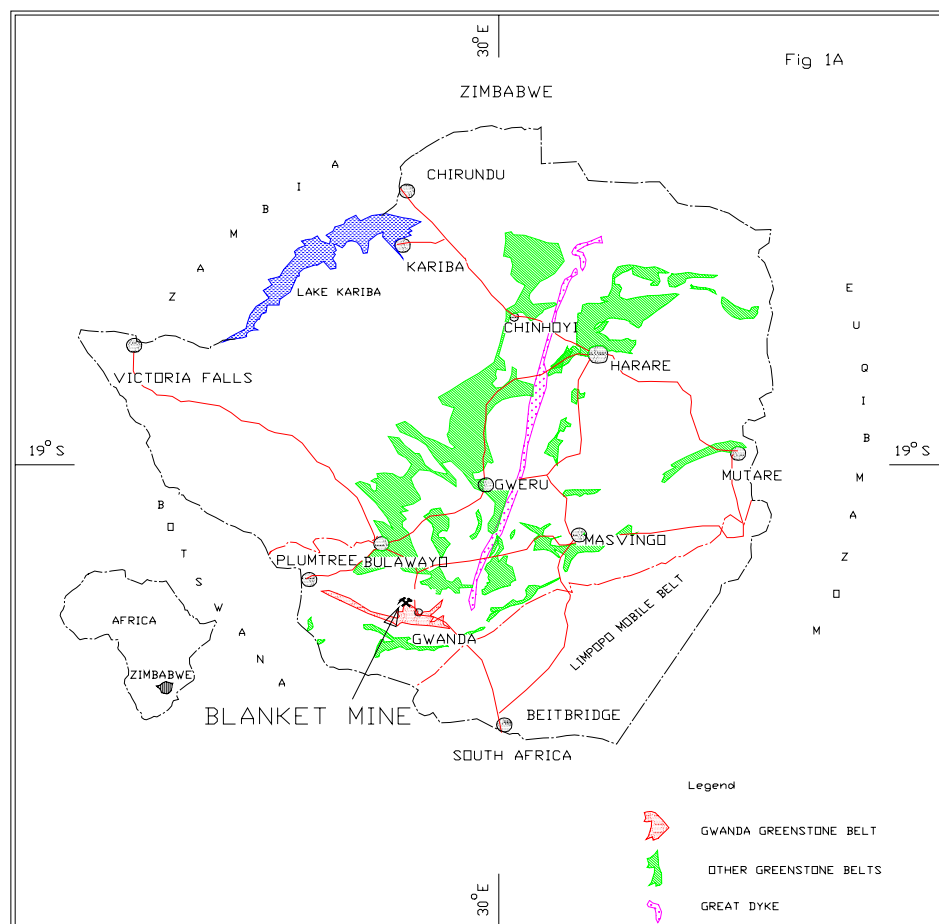
**Figure 6.1 Map of Zimbabwe showing location of Blanket Mine**

## 6 PROPERTY DESCRIPTION AND LOCATION

### 6.1 Area and Location

The Blanket Mine is situated in south western Zimbabwe. Blanket mine's ground holdings comprise a total of 225 blocks of claims covering an area of 2,540 Ha, 16 km northwest of the town of Gwanda (population 30,000), the provincial capital of Matabeleland South. The property lies some 560km southwest of Harare (the capital of Zimbabwe) and 130km south of Bulawayo, Zimbabwe's second largest city. In topocadastral terms the mine is on Latitude 20° 52'S and Longitude 28° 54' E, topographical sheet N°-2028D4 (Figure 6.1).

The mine is situated in the northwestern end of the Gwanda greenstone belt (Figure 6.2).

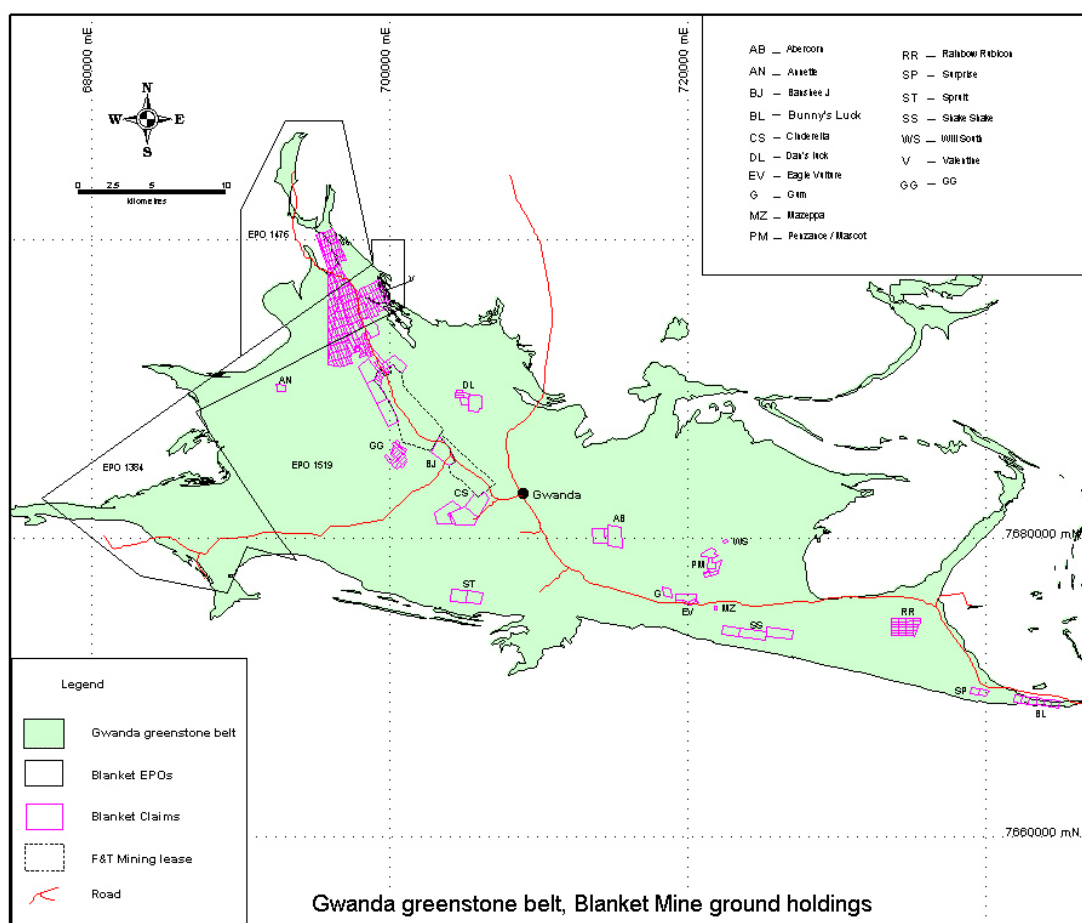


**Figure 6.2 Geological Setting of the Blanket Mine relative to Greenstone Belts in Zimbabwe**



## 6.2 Tenure

In terms of the transaction details published on the 20<sup>th</sup> June, 2006, Blanket Mine is a wholly owned subsidiary of Caledonia Mining Corporation, a Canadian registered company listed on the Toronto Stock Exchange. The mine is controlled by Blanket Mine (1983) (Private) Limited, a Zimbabwean registered company and the entity actually acquired by Caledonia. The producing claims holdings around the mine comprise 225 blocks (Appendix I and Figure 6.3) covering an area of 2,540 Ha. The mine is in the process of converting part of these claims into a Mining Lease, which simplifies the procedure for the protection of mineral rights and confers on the holder surface rights as well as the mineral rights (Figure 6.4). The claims not covered by the proposed mining lease do not form part of the current production areas and will continue to be protected by payment of an annual fee to the Ministry of Mines. The mineral rights holder is “Blanket Mines Limited”.



**Figure 6.3 Blanket Mine Claims Holdings**

A full legal due diligence was conducted by Roodt and Associates Inc. immediately prior to the acquisition of the mine by Caledonia. This investigation confirmed the legal tenure of the mineral properties and verified the fact that there is no current litigation that may be material to the Blanket Mine. Therefore, Applied Geology have not conducted a full legal due diligence on the claims title. The historical tenure situation has not changed for the past 20 years.

The mine is operating under a Special Licence No. 5030 issued under the Mines and Minerals Act and all its claims have been duly protected in terms of these regulations.

Ore from underground carries no third party royalties, these being covered by payment of the annual claims protection fees to the Ministry of Mines.

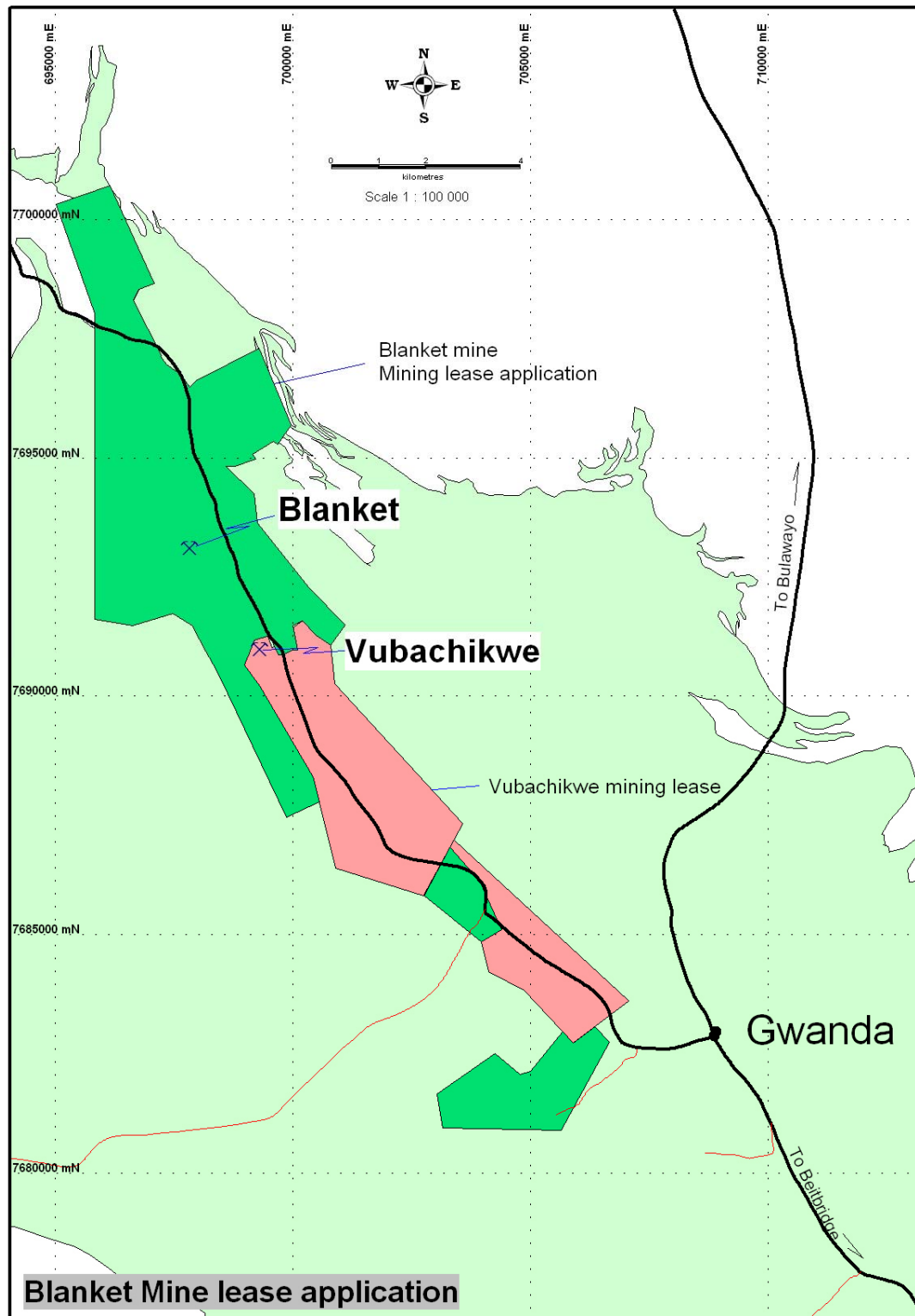


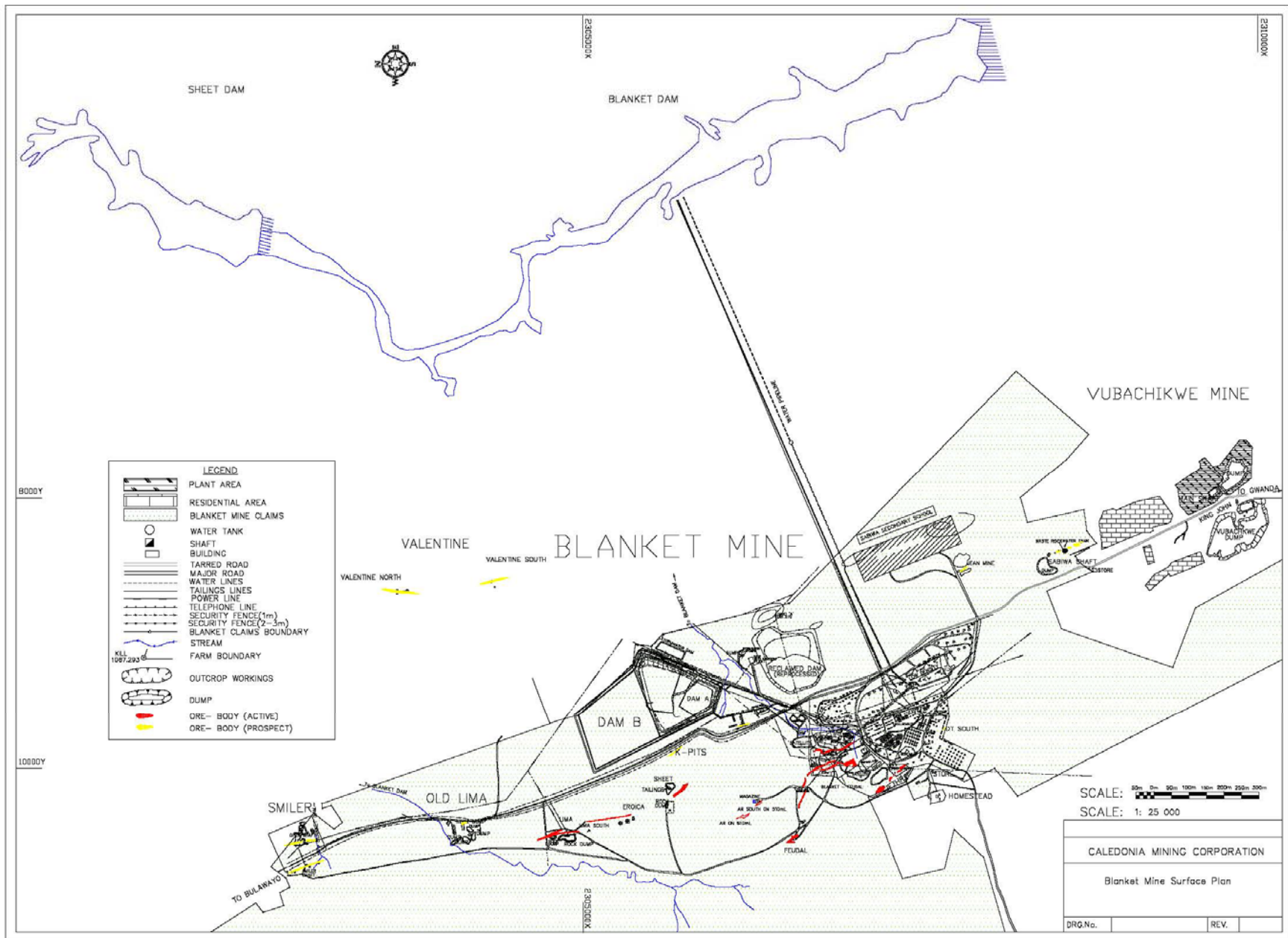
Figure 6.4 Blanket Mining Lease Application

The location of all known mineralized zones, mineral resources, mineral reserves and mine workings, existing tailing ponds, waste deposits and improvements are illustrated on the General Surface Plan (Fig. 7.1).

To the best of our knowledge, the property is not subject to any royalties, back-in rights, payments or other agreements and encumbrances.

Environmental liabilities arise mainly from the mine's sliming operations although smaller liabilities stem from the mine's previous open-stopping operations, rock dump sites and reduction works. While the main concern with the latter activities is the rehabilitation of the surface disturbances, the Main Residue Deposit, because of its high sulphide content, poses the risk of acid water drainage. However, drainage and groundwater samples are taken monthly at numerous points around the dam and to date no indication of acid drainage has been detected.



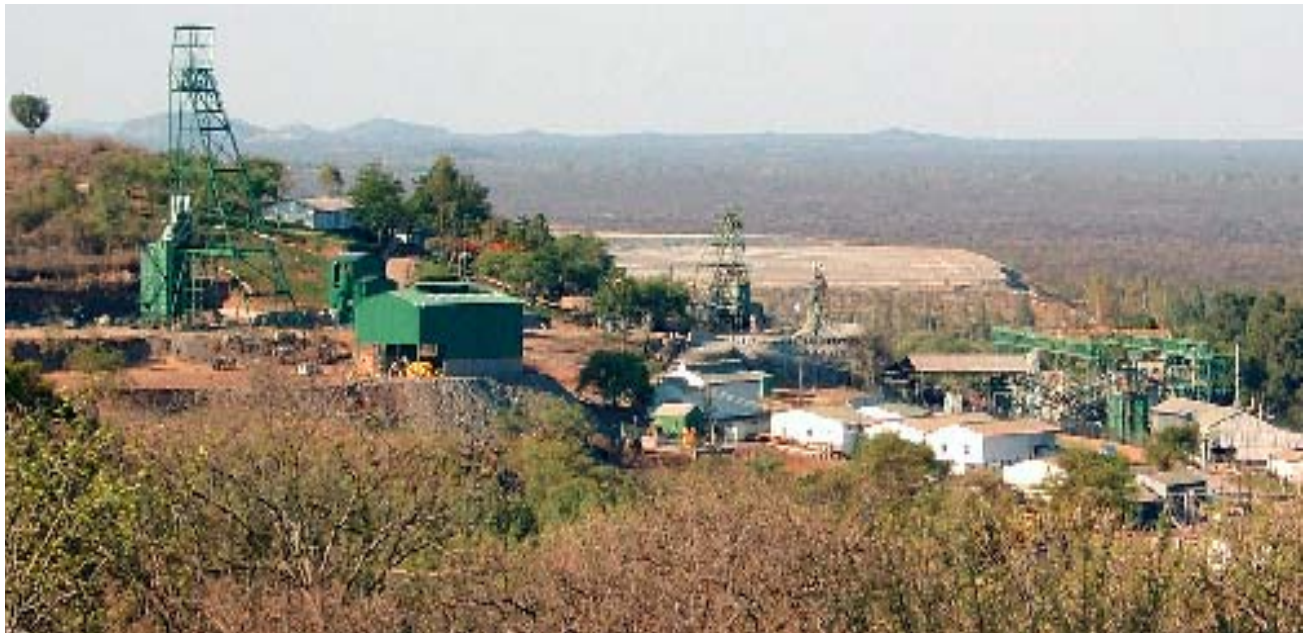


## **7 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE and PHYSIOGRAPHY**

### **7.1 Topography and Accessibility**

The regional terrain is fairly flat with hills in the area around the mine and the town of Gwanda (Fig. 7.2). The area lies at an altitude of between 1,000 and 1,200m a.m.s.l. The general topography of the Mine Area comprises shallow open valleys, drained by annual streams flowing generally to the north-east and merging with the Thadezi River on which the Sheet Dam and Blanket Dam are located east of the mine (Fig. 7.1).

Blanket mine is readily accessible from the town of Gwanda 16 km to the south-east, by a single strip tarred road. The town of Gwanda is in turn accessible from Bulawayo by 126 km of national highway.



**Fig. 7.2 Photograph of Blanket Mine viewed in a northerly direction**

### **7.2 Climate and Weather**

Blanket has a tropical climate with hot humid summers and mild winters. The annual rainfall ranges between 400mm and 500mm and falls from late October to mid-March. The remaining months are hot and dry with mild winter days. Operations run all year round, with minimal disruptions caused by unfavourable weather.

### **7.3 Vegetation**

The vegetation around Blanket has largely been denuded and replaced by thorny acacia scrub (Fig. 7.1). Indigenous vegetation away from settlements is typical savanna (marula and combretum species) with mopane groves and related bush, and

localised patches of grassland. However the bulk of this has since been cut down for domestic use leading to the sprouting of second and third generation acacia and thorny bush especially near current settlements.

In view of the relatively low rainfall, there is no commercial forestry in the area. Agriculture is restricted to small quantities of maize and vegetables in the settlement areas for private use. The land is better suited to subsistence ranching than to cultivation.

## **7.4 Local Population and Transport Systems**

The town of Gwanda, with an estimated population of 30,000, is the local hub with erratic scattered settlements throughout the area. The mine labour force together with their families, a population of about 3,000, reside within one kilometre of the mine premises in accommodation supplied by the mine.

The mine is accessible from the town of Gwanda by a tarred road. Gwanda is on the national highway between Beit Bridge on the South African border 200 km distant and Bulawayo, and is situated 126 km from Bulawayo.

The main railway line connecting the national network to South Africa passes through Gwanda, and there is an aerodrome catering for light aircraft outside the town.

## **7.5 Operational Resources**

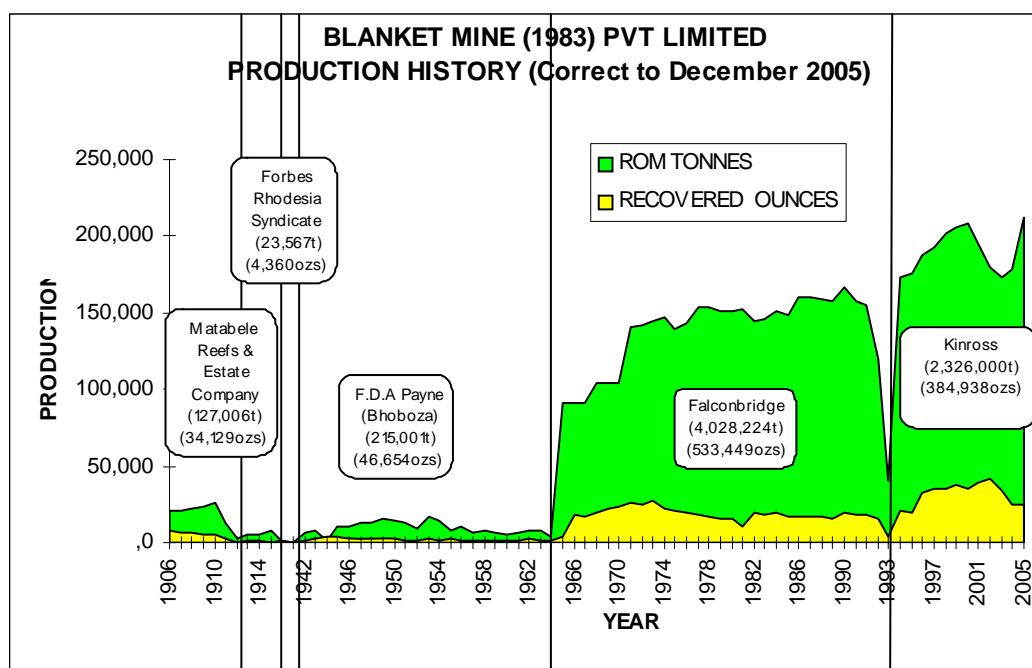
The mine's surface infrastructure relative to the mineralisation is shown in Figure 7.1. Major infrastructure consists of underground workings, a process plant and a tailings dam. All stores, workshops, offices, assay laboratory and plant lie close to the main shafts.

Tailings are deposited to the east of the mine on a two-compartment dam, which is operated by Frazer Alexander Zimbabwe. This dam has a design life of ten years given the current LoM plan, which will be adequate until 2016.

There is adequate space on surface for any future expansion in production. Currently the surface rights are privately held but these can be acquired by the mine upon completion of the Mining Lease formalities.

Process and domestic water is obtained from the 15 Mm<sup>3</sup> capacities Blanket Dam which is 5 km east of the mine. In addition, the mine has equipped several boreholes to alleviate water shortages during times of drought. The above normal rainfall of the past rainy season has provided sufficient water for the following dry season.

Two power lines of 11 kVa and 33 kVa connect the mine to the national grid, which is owned and operated by the Zimbabwe Electricity Supply Authority (ZESA).



**Figure 8.1 Blanket Mine Production History**

## 8 HISTORY

### 8.1 Production History

The so-called ‘ancients’ mined the Blanket reefs extensively prior to the 19th century. Subsequent to British colonisation in the 19<sup>th</sup> century, claims were first pegged in 1901 and acquired by the Matabele Reefs and Estate Company who mined 128,000 tonnes of ore between 1906 and 1911. From 1912 to 1916, the Forbes Rhodesia Syndicate milled 23,000 tonnes, but for the period 1917 to 1941 there are only sporadic records of production. In 1941 F.D.A. Payne resumed mining and milled 224,000 t before selling the property to Falconbridge Gold Corporation in 1964. Production increased significantly, and to the end of September 1993 when Kinross Gold Corporation acquired the property, a further four million tonnes of ore had been processed. Kinross further increased production by way of dump re-treatment. At the end of 2005 the Mine joined the elite club of mines scattered over Zimbabwe greenstone terrains that have produced in excess of one million ounces of gold. To date the mine has a recorded production of 1,004,000 oz of Au at an average grade of 4.79 g/t Au (Figure 8.1 and Table 8.1).

**Table 8.1: Summary of Blanket Mine Production by Owner**

Owner	Period	Production	
		Tonnes	Rec. Oz
Matabele Reefs and Estate Co.	1906 to 1912	127,000	34,129
Forbes Rhodesia Syndicate	1912 to 1916	24,000	4,360
No activity	1917 to 1941	-	-
F.D.A. Payne (Bhoboza)	1942 to 1964	215,000	46,654
Falconbridge	1965 to September 1993	4,028,000	533,449
Kinross Gold Corporation	October 1993 to June 2006	2,425,400	396,636
Caledonia Mining Corporation	June 2006 to	*	*

## 8.2 Ore Resource and Reserve Disclosures

During 2002, SRK carried out an audit of the resource and reserve computation methodology practised on the mine. They recommended in their findings that a more conservative approach be applied especially to the reserve categories. Following this change in resource and reserve computation, the reserve and resource statement given in Table 8.2 was published. Mineral Resources are additional to the Mineral Reserves.

**Table 8.2 Ore Resource and Reserve Statement as at 31 December 2002**

	<b>Tonnes</b>	<b>Grade g/t Au</b>	<b>Gold oz</b>
<b>Mineral Resources</b>			
Measured	827,000	4.4	117,160
Measured – Pillars 1	213,000	4.9	33,200
Total Measured	1,040,000	4.5	150,360
Indicated	1,043,000	4.6	155,100
Indicated below 750m	571,000	4.4	80,420
Vubachikwe tailings	530,000	0.9	14,480
Blanket tailings	55,000	1.1	1,870
Satt 1 tailings	6,000	0.9	170
Sabiwa tailings	119,000	2.1	8,000
Total Indicated Resources	2,325,000	3.5	260,040
<b>Total Measured &amp; Indicated</b>	<b>3,365,000</b>	<b>3.8</b>	<b>410,400</b>
<b>Inferred (all below 750 m)</b>	<b>2,120,000</b>	<b>6.4</b>	<b>437,560</b>
<b>Mineral Reserves</b>			
Proven	858,000	4.1	113,090
Proven – Pillars <sup>#</sup>	221,000	4.5	32,080
Probable	1,083,000	4.3	149,720
Probable – Vubachikwe tailing	530,000	0.9	14,480
Total Proven and Probable	2,471,000	3.5	309,370

<sup>#</sup> SRK reduced the tonnage of resources and reserves in pillars by 50% to reflect uncertainty in mine's ability to recover 100%.

Measured and Indicated resources above the 750m level were back-calculated from reserves using dilution factor of 7.5% at zero grade and mine call factor of 96%.

Subsequent estimations and disclosures have followed the same procedures with relatively minor changes year-on-year. The deep drilling program aimed at exploring the depth extent of the mineralized shoots was largely completed by 2001 and hence the addition to reserve blocks is a consequence of detailed evaluation drilling and sampling which follows reef development. The quantum of resources has, however, remained relatively unchanged on account of the lack of exploration drilling.

Prior to the compilation of this report, the last public ore reserve and resource disclosure was at 31 December 2004.

**Table 8.3 Reserve and Resource Inventory as at 31<sup>st</sup> December 2004**

MINERAL RESERVES (@Au price US\$400/oz)

Classification	Tonnes	Grade Au g/t	Content kg	Content ounces
PROVEN ORE				
Operating Areas	728,000	4.23	3,080	99,000
Pillars	219,000	4.69	1,030	33,000
Blanket Tailings	150,000	1.72	258	8,000
TOTAL PROVEN ORE INCLUDING PILLARS	1,097,000	3.98	4,368	140,000
PROBABLE ORE				
Operating and Development Areas	1,386,000	4.17	5,780	185,800
Total Proven +Probable Ore (including pillars)	2,483,000	4.09	10,148	325,800

(Note that only 50% of Pillar inventories are declared following the SRK audit of 2002)

MINERAL RESOURCES (@Au price US\$450/oz)

Indicated	807,000	4.10	3,310	106,400
Inferred	2,064,000	6.31	13,025	418,700
TOTAL RESOURCES	2,871,000	5.69	16,335	525,100

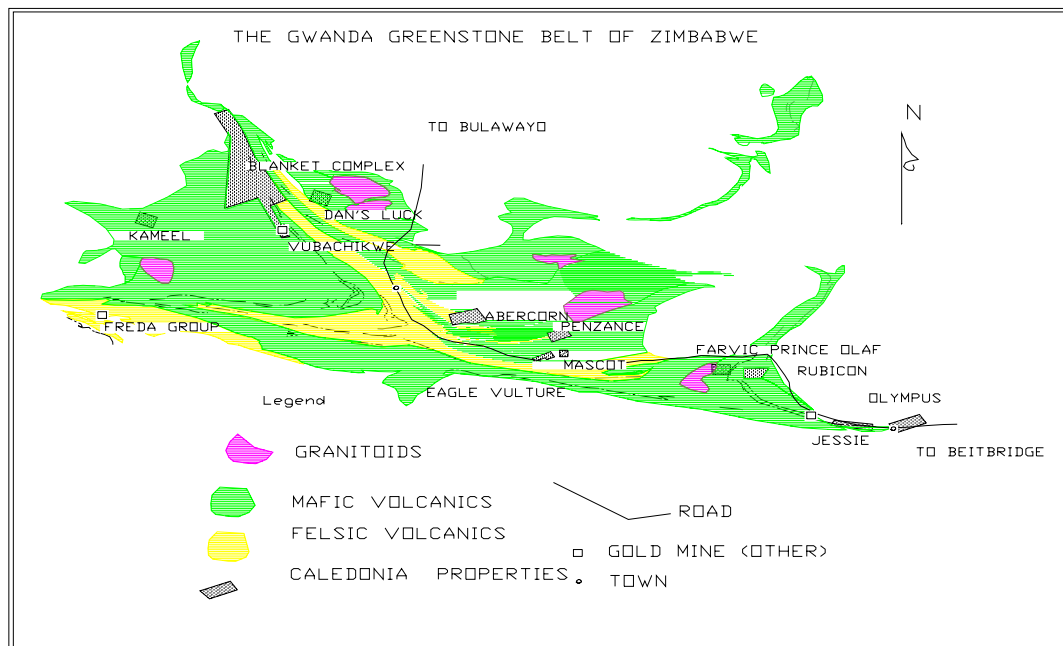
NOTE by AG: In terms of the CIM 43-101 requirements, Inferred Resources should not be included with Indicated Resources as in the above table. The above table is included for the purposes of historical continuity only.

## 9 GEOLOGICAL SETTING

### 9.1 Gwanda Greenstone Belt

The Blanket Mine exploits a fairly typical Archaean greenstone-hosted deposit. The deposit is situated on the northwest limb of the Gwanda Greenstone Belt along strike from several other gold deposits (Figure 9.1). The property is one of three remaining big producers from a belt that had no less than 268 operating mines at one time. The other two are the nearby Vubachikwe Mine run by Forbes and Thompson and the Jessie mine on the southeastern end of the belt and owned by F.A. Stewart and Son.





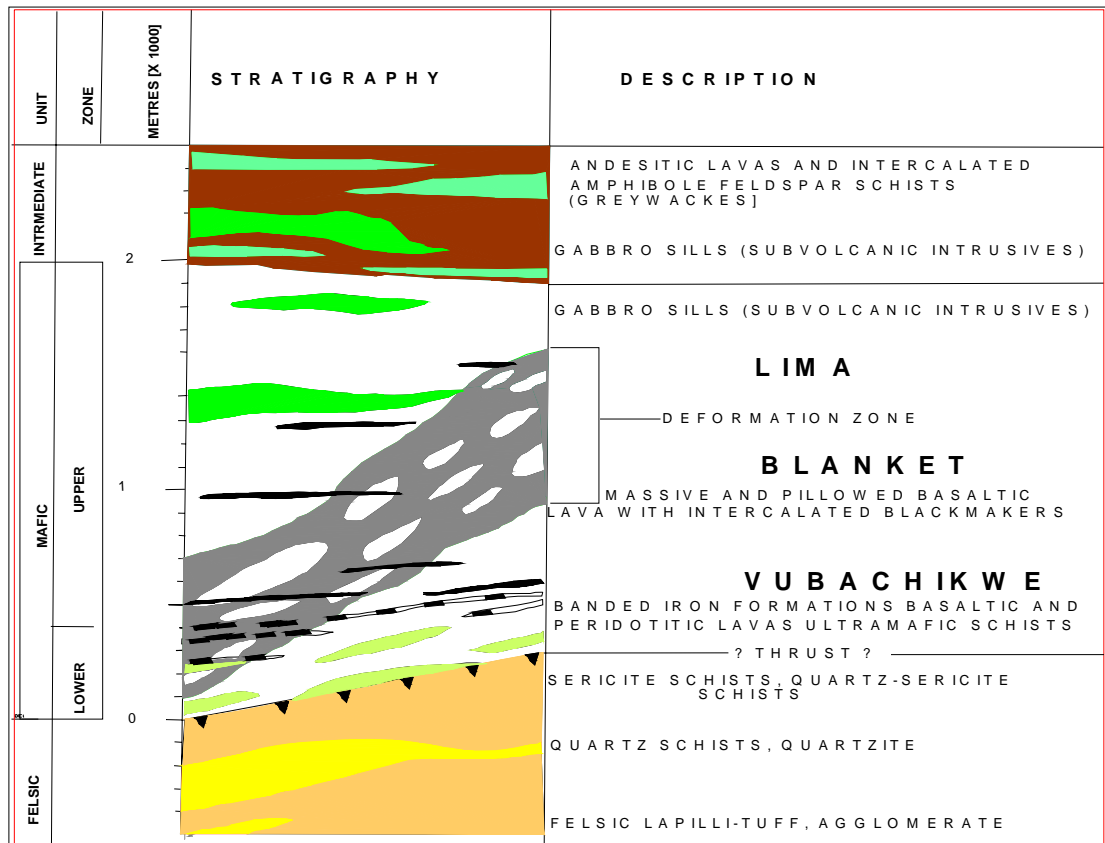
**Figure 9.1 Regional Geology of the Gwanda Greenstone Belt and location of Blanket Mine claims**

The lithological units surrounding the mine comprise an underlying felsic schist of either igneous or sedimentary origin followed by ultramafic to mafic rocks containing layers of banded iron formation overlain by a thick sequence of mafic rocks. The banded iron formation unit hosts the nearby Vubachikwe mineralisation while the Blanket Mine lies within the overlying mafic unit. A regional dolerite sill cuts the entire sequence from Vubachikwe through Blanket to the Smiler deposit, some 3 km to the north. All of these lithologies have experienced significant and repeated deformation.

Fuchter (1990) defined four phases of deformation with the second D2 event producing wide zones of intense schistose deformation which were considered to be associated with gold deposition. The earlier thrust D1 phase has a coincident trend and may be an early part of the D2 event. The evidence for the D1 thrusting lies in the repetition of lithological units, particularly in the northwest arm of the greenstone belt.

The D3 deformation is the most evident on geological maps and aerial imagery and gives rise to the large fold structures that dominate the east and western ends of the greenstone belt. The Blanket/Vubachikwe mineralisation lies on the northern limb of the large western fold (the North West Mineralized Camp). The final D4 deformation has produced major lineaments that dominate the southern margin of the greenstone belt.

On account of the close proximity of the Gwanda Greenstone Belt to the high-grade metamorphic Limpopo Mobile Belt, the grade of metamorphism at Gwanda is upper greenschist to amphibolite facies. These metamorphic conditions are distinctly higher than in the typical Zimbabwean greenstone belts.



**Figure 9.2 Stratigraphic sequence in the vicinity of Blanket Mine**

## 9.2 Local Property Geology

The local geology consists of a basal felsic unit in the east that is not known to be mineralized. It is generally on this lithology that the tailings disposal sites are located. To the west of this unit is the ultramafic zone that includes the banded iron formations hosting the eastern dormant cluster and the ore bodies of the nearby Vubachikwe complex. The active Blanket ore bodies occur in the immediately overlying mafic unit. An andesitic unit caps and completes the stratigraphic sequence.

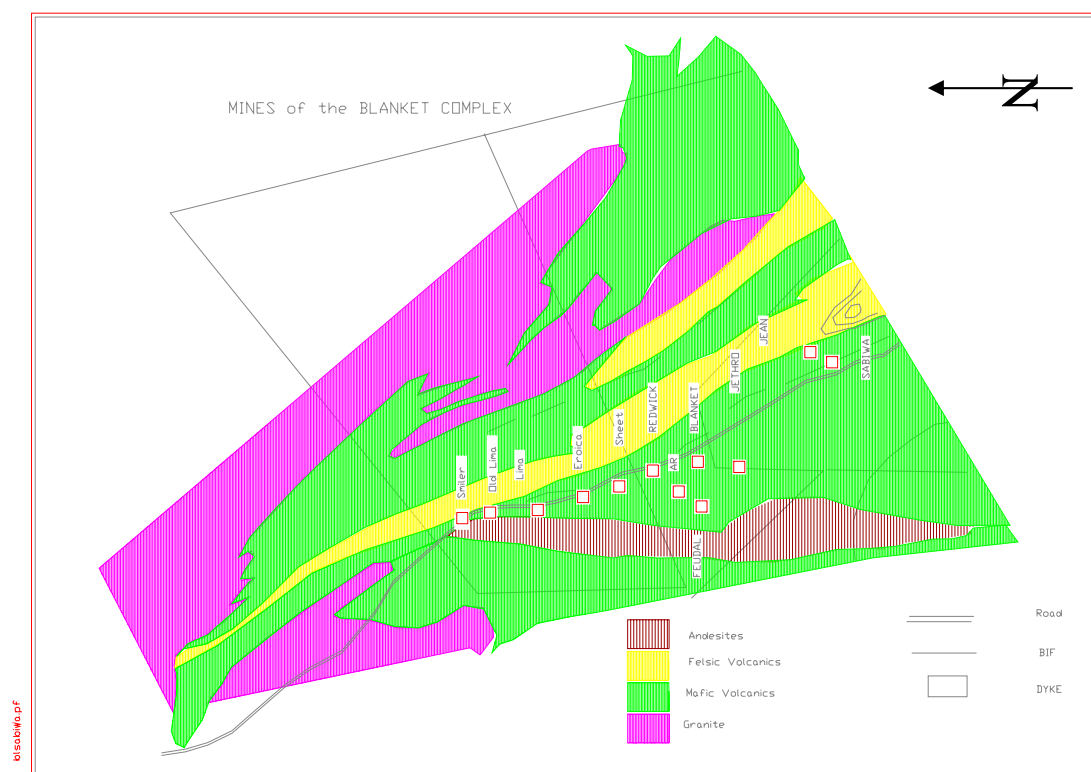
Blanket Mine is part of the group of mines that make up the North Western Mining Camp otherwise also called the Sabiwa group of mines. What is today referred to as Blanket Mine is a cluster of mines extending from Jethro to the south, through Blanket itself, the currently defunct Feudal, AR South, AR Main, Sheet, Eroica and Lima (Figure 9.3). In addition, dormant old workings include Sabiwa from the south, Jean, Provost, Redwick, Old Lima, and Smiler. This latter group of mines form the northern continuation of the Vubachikwe zone and are hosted by banded iron formations.

The mafic unit which hosts the gold mineralisation is for the most part a metabasalt with occasional remnants of pillow basalts. Regionally, the rock is a fine-grained massive amphibolite with localised shear planes. A low angle transgressive shear zone up to 50m wide cutting through the mafic zone is the locus of the gold ore



shoots. The shear zone is characterised by a well developed fabric and the presence of biotite.

A regional dolerite sill cuts the entire sequence from Vubachikwe through Blanket to Smiler. The sill does not cause a significant displacement and although it truncates all the ore shoots, there is continuity of mineralisation below the sill.



**Figure 9.3 Locality Plan of Workings in the Blanket Mine Production Area**

## 10 DEPOSIT TYPES

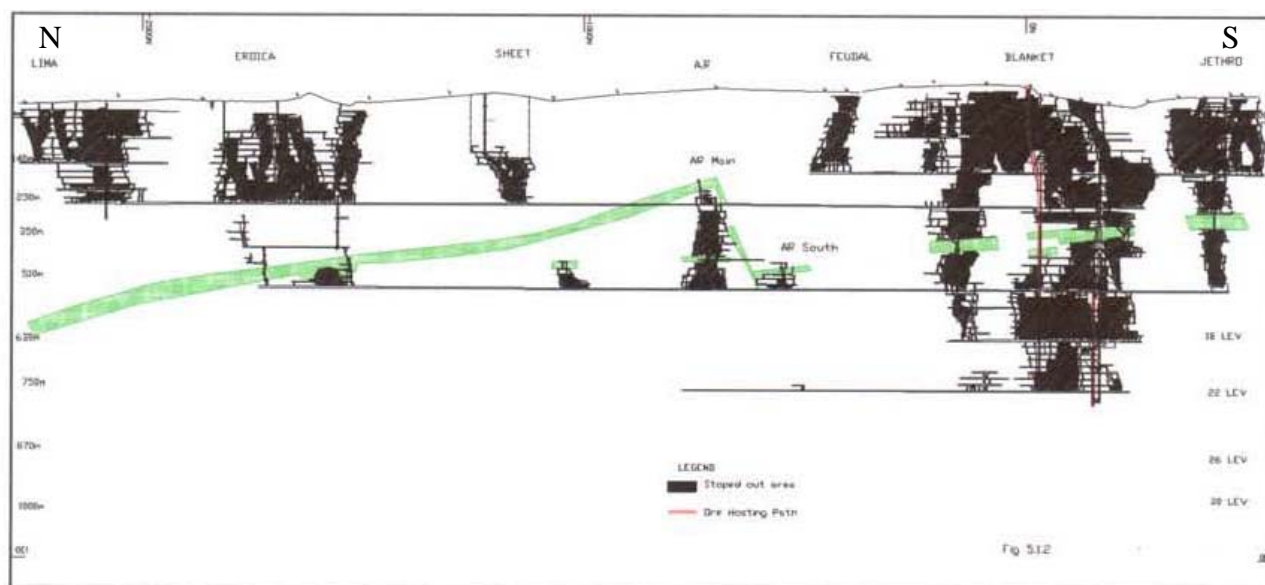
Active mining at the Blanket mine takes place over a 3 km strike that includes from the Jethro deposits in the south, through Blanket itself to the Feudal, and northwards to AR South, AR Main, Sheet, Eroica and Lima deposits. These deposits have varying strikes and they are not all on the same plane. Figure 9.3 presents a plan view of the Blanket Mine deposits while Fig 10.1 provides a north south longitudinal section showing the attitude of the various Blanket ore shoots.

Mineralisation occurs in near vertical shoots aligned along an approximately N-S axis. The ore shoots vary in shape from the tabular-lensoidal quartz reefs to the massive to pipe-like disseminated sulphide reefs (DSR).

All mineralisation is hydrothermally emplaced and is associated with the regionally developed D2 deformation characterised at Blanket by areas of high strain wrapping around relatively undeformed remnants of the original basaltic flows. It is within the more ductile tensional high strain areas that the wider of the ore bodies are located. The localisation of the shears hosting the mineralisation may conform to a Riedel

pattern but these needs to be confirmed by a more detailed study and may assist with future exploration targeting.

Mineralisation at Vubachikwe mine immediately to the south of the Blanket property is hosted essentially in banded iron formation (BIF) units. These BIF units are grunerite-magnetite-quartz rocks which are locally folded into tight fold structures with a pronounced vertical lineation. Auriferous sulphide minerals occur as a replacement of the iron-rich minerals along the hinges of the folds in the BIF. This type of mineralisation represents a third ore type in the Blanket area.



**Figure 10.1 A north south longitudinal section of the Blanket Ore Shoots**

## **11 MINERALISATION**

The economic mineralisation at Blanket Mine is gold with approximately 10% by-product silver. Uneconomic quantities of arsenic, copper, lead and zinc are associated with some of the mineralized zones.

Two main types of mineralisation are recognised.

### **11.1 Disseminated Sulphide Replacement (DSR) Reefs**

The first type is a disseminated sulphide replacement type (DSR), which comprises the bulk of the ore shoots. Typically these zones have a silicified core with fine sprays of disseminated arsenopyrite hosting the best grades. Radiating from the core is a package of silicified biotite chlorite schist with irregular quartz stringers and disseminated and stringer arsenopyrite in the fabric planes, at relatively high grade. The margins of these mineralised zones are characterized by abundant biotite and chlorite on account of the lesser silicification and as a result have a lower gold content. Disseminated sulphide-replacement ore bodies range up to 50 m in width with a strike between 60 m to 90 m. Free-milling gold constitutes up to 50% of the total metal content with the remainder locked within the arsenopyrite. Despite the

arsenopyrite association, the ore is not refractory and plant recoveries of 85 to 90% are generally achieved.

## **11.2 Quartz-filled Reefs and Shears**

Quartz-filled shear zones form the second type of mineralisation. Two quartz shears are mined at Blanket Mine, the Blanket Quartz Reef and the Eroica Reef (Figs. 9.3 and 10.1). These reefs tend to have long strikes but are not uniformly mineralized although continuous pay shoots of over 100 m on strike are not uncommon. The Quartz Reef at Blanket has a surface strike of some 500 m, but economic mineralisation is restricted to three 90 m-long shoots which were defined on surface by the early workers. There is much wider grade range compared to the DSR deposits, but on average these shears are higher grade and used as a “sweetener” of ore to the mill. Native gold and galena are the dominant minerals although arsenopyrite becomes more prevalent below the 470 m elevation.

There is some evidence, as suggested by the increasing arsenopyrite association with depth, that the quartz shears represent higher level offshoots and splays with brittle deformation relative to the more ductile DSR-type core zone mineralized bodies.

## **12 EXPLORATION**

Exploration activities at Blanket Mine are carried out both on and off mine. On-mine exploration takes place on producing claims, is mostly underground, and is focussed on expanding the knowledge of the ore shoots being mined as well as exploring for potential additional ore bodies within the main mineralised zone.

Off-mine exploration takes place on the non producing claims and ground applied for under EPOs (Exclusive Prospecting Orders), which are removed from the mine property and which have the potential to yield new sources of ore and possibly give rise to new mines.

### **12.1 Underground Exploration**

Underground or on-mine exploration is primarily accomplished by diamond drilling. The main haulages linking the various deposits provide ideal vantage points from which to drill for otherwise unreachable shoot extensions. In addition, these access ways provide excellent lithological exposure which allows for both the large scale and small scale features of the mineralized zones to be sampled and studied. Based on the structural patterns so encountered as well as assay data, potentially new mineralized zones can be targeted. It is recommended that detailed studies of the shear systems peripheral to the mineralized shoots and their structure be carried out as a means of generating a comprehensive ore body model for Blanket Mine which will be invaluable as an exploration tool.

Exploration drilling from underground takes place from the main haulages linking the different ore bodies. It entails drilling boreholes at either 50 m or 100 m from lay byes and cubbies located either side of the haulage. The haulages are generally mined parallel to the general structural trend of the mineralized zones. The boreholes allow

for the collection and documentation of rock packages, alteration characteristics, structural occurrences and the development of mineralisation systems likely to be developed into ore bodies. Such bodies can be quickly brought into production because of proximity to the mine handling systems. A sweep of 500 m is scanned by this means.

## **12.2 Mine Claims Exploration**

Within the boundary of the producing claims, a number of dormant previous producing workings exist within haulage distance of the Blanket Mine plant. Some of these include Sabiwa, Valentine, Old Lima and Smiler, all of which lie within a 5 km radius of the plant (Fig. 9.3). Mine claims exploration aims to develop a drilled resource with the minimum of delay and to increase the property resource portfolio. Emphasis is generally on previous high tenor properties with a view to supplementing the Blanket Mine operations grade.

Depending on land access, these claims are first prioritized according to existing geological information, geochemical and geophysical characteristics. Follow up work is normally done by drilling short confirmatory holes before embarking on an intense drilling program.

## **12.3 Regional Exploration**

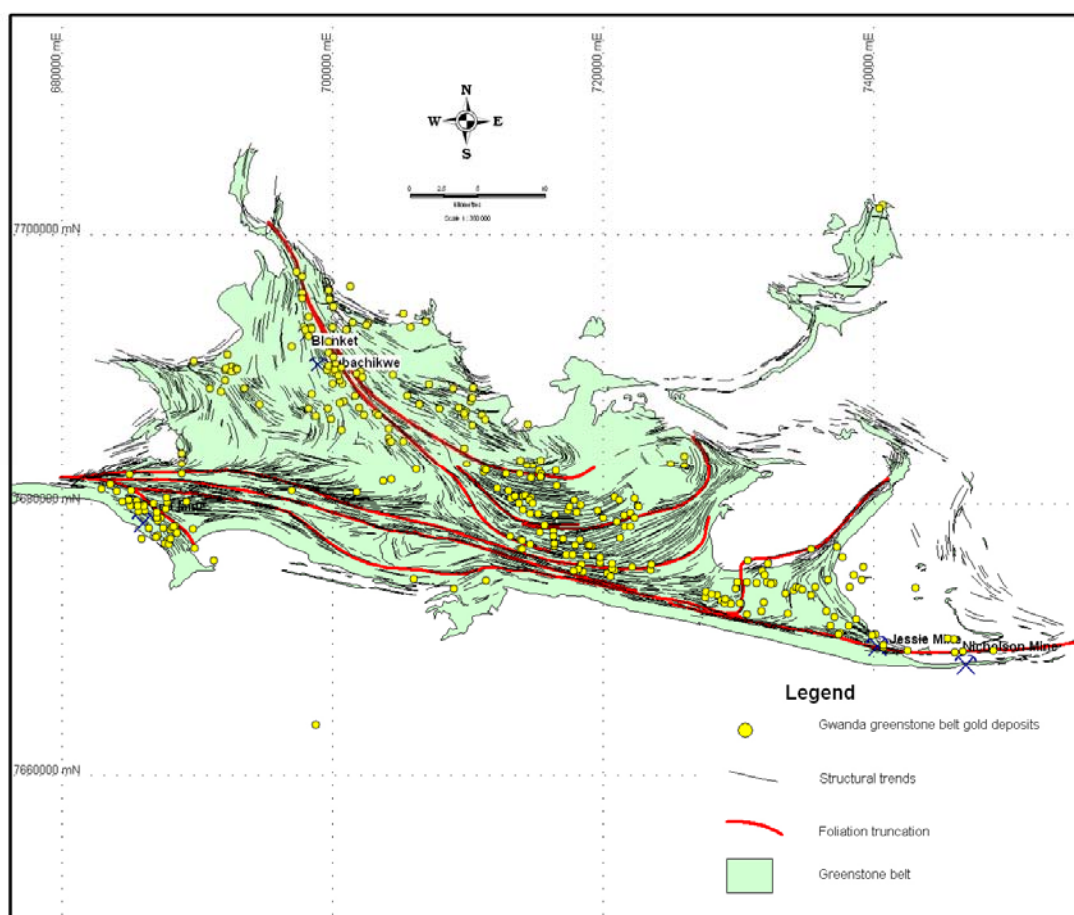
In addition to the mine claims, the Blanket Mine holds both blocks of claims away from the production concentration and has applied for a total of thirteen exploration licenses (Exclusive Prospecting Orders, or EPOs) spread throughout the greenstone terrains widely scattered over Zimbabwe. The total number of non-production claims is 322 with a combined area of 5,264 Ha, while the total area applied for under EPOs totals 320,541 Ha.

The exploration unit at Blanket Mine operates independently of the mine operations but under the control of mine management. All exploration work is funded by the mine via special capital provision funded out of operating income. All surface exploration is managed by the exploration unit which, in addition to exploring some of the old workings near the mine, is primarily concerned with exploration of the claims removed from the mine claim area. While the bulk of the claims are located in the Gwanda Greenstone Belt, a large number of claims are held in greenstone belts up to 500 km from Blanket Mine. Owing to the limited financial resources available for exploration in general, and the additional logistics required to carry out exploration activities far from the base camp (mine site), the majority of the exploration has been conducted in claims in the Gwanda Greenstone Belt (Fig. 6.3).

Gwanda Greenstone Belt itself has many gold showings outside of the known mining areas (Fig. 12.1). Claims have been pegged over a number of these showings and follow up work by the mine exploration team is in progress. Grassroots exploration tools are used in identifying anomalous areas deserving of further investigation, viz. low level gold geochemistry, Ionization Potential (IP), Self Potential (SP) and Resistivity. Positive results from these methods will constitute a potential drilling target.

### 12.3.1 Mazoe Joint Venture

The Mazoe Joint Venture is exploring a block non-producing claims near Bindura on the Shamva Greenstone Belt. These claims were held as part of a joint venture agreement with Ashanti (now AngloGold Ashanti) and Ashanti sold its interest to Mwana Africa. Mwana Africa inherited the controlling interest in these claims from Ashanti, and Blanket Mine's share in the joint venture, currently at 40%, will be diluted by the ongoing work.



**Figure 12.1 Gwanda Greenstone Belt Gold Deposits**

### 12.3.2 Bubi Claims – Bulawayo Greenstone Belt

A number of small claims blocks are held in this area, viz. Loxley, Lonely North, Peter Pan, BIF and Bubi Mine (perimeter). The area has been sampled for low level gold and the results show that Lonely North and Loxley are particularly encouraging. The prospect is awaiting drilling but is 250 km distant from Blanket Mine.

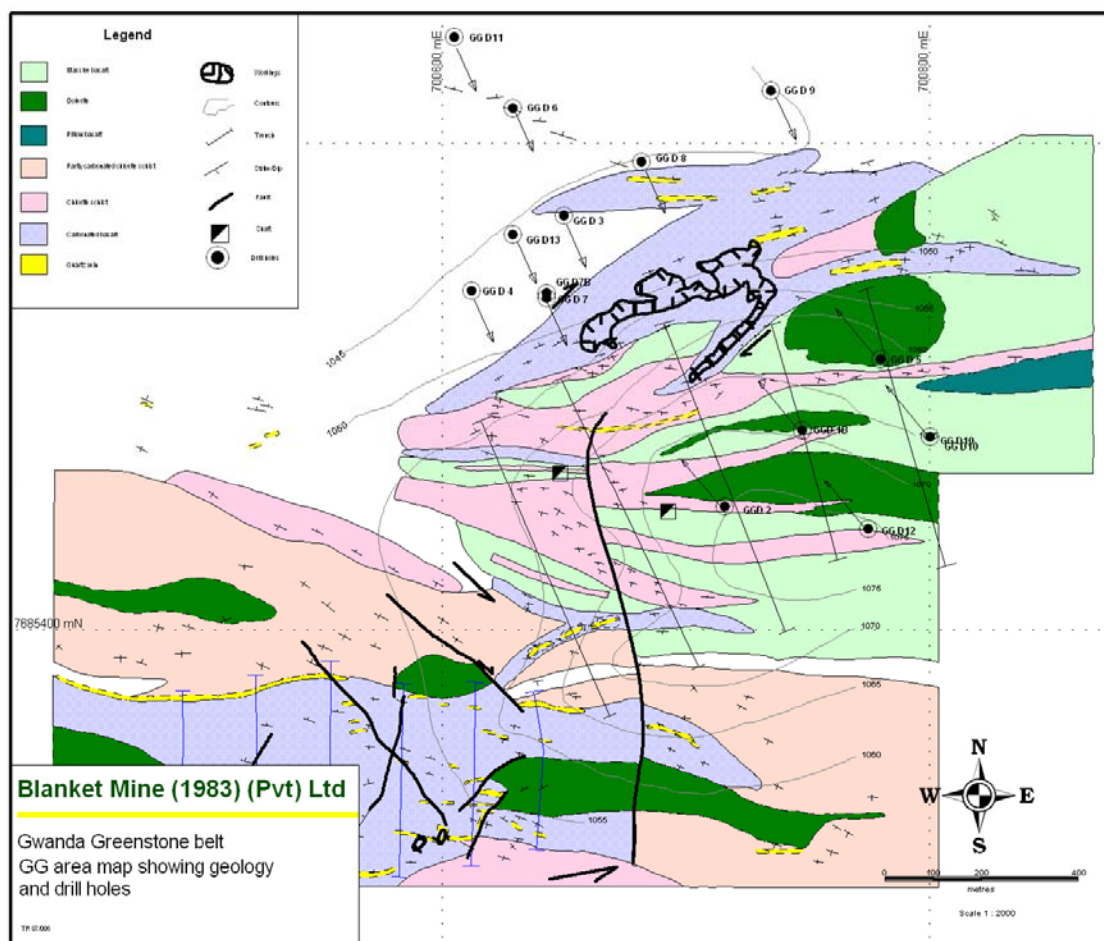
### 12.3.3 Abercorn Claims – Gwanda Greenstone Belt

Abercorn lies 5 km east of Gwanda. Mineralisation occurs in a series of shear zones on the contact between quartz schists and hornblende schist and between the

hornblende schist and a gabbro unit. Blanket Mine has been working on the property since 1996 and in 2005 drilled a total of 790 m to an average depth of 60 m (Fig.13.2). A banded quartz reef and a blue quartz reef were intersected. Mineralisation consists largely of arsenopyrite in the veins and immediate wall rocks. The intersections are narrow (<50 cm) and the shoots have limited strike (<50 m).

#### 12.3.4 GG Claims – Gwanda Greenstone Belt

GG Claims are situated 15 km south east of Blanket Mine. Blanket has an option over 11 claims blocks as well as 5 claims of its own. Mineralisation occurs in a chlorite schist shear zone within basaltic lava units (Fig. 12.2). Thirteen cored boreholes were drilled at GG during 2005/6 (Table 12.2). The holes intersected bleached chlorite-sericite schists containing stockworks of narrow quartz veins. North Main and South Main zones were identified having formed at the junction of two SW – NE shear zones. Although low grades were generally encountered, the North Main in particular is characterised by substantial intersection widths up to 28 m (average 3.4 g/t over 9.0 m true width). Resource definition work is currently in progress at this prospect.



**Figure 12.2 Geological Map of the GG Prospect showing Location of Exploration Drilling**

**Table 12.1 Drill Core Results for the GG Prospect**

Hole	South Main		North Main	
	grade (g/t)	width (m)	grade (g/t)	width (m)
GGD-1	2.17	2.82	4.10	13.94
GGD-2	4.35	10.00	1.01	14.30
GGD-3	4.73	12.00	1.01	12.00
GGD-5	3.38	27.50	1.03	11.00
GGD-6	3.78	8.00	1.01	16.60
GGD-7	4.28	8.27	1.04	1.50
GGD-8	2.24	2.43	1.07	6.00
GGD-9	1.83	3.00	0.79	0.55
GGD-10	3.27	15.16	2.75	12.47
GGD-11	2.01	6.50	1.10	2.50
GGD-12	0.01	4.00	1.06	8.50
GGD-13	2.96	28.00		

## 13 DRILLING

### 13.1 On-Mine Drilling

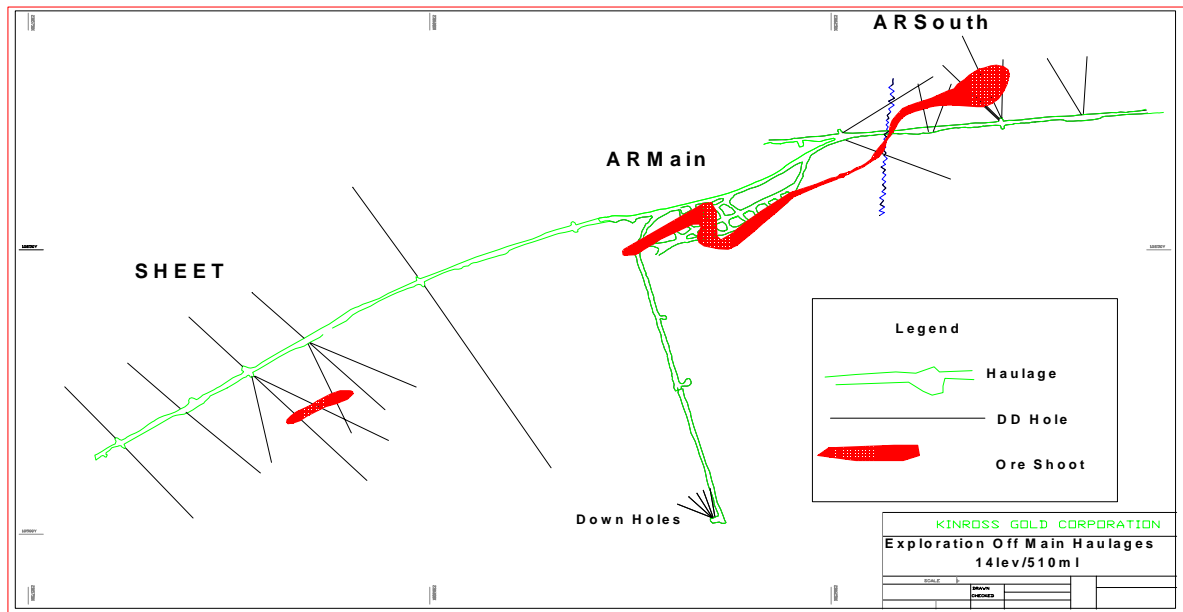
Diamond drilling is the primary method of exploration used by the mine to replenish its reserve base and probe for extensions to existing ore bodies as well as to explore for further ore bodies within the immediate vicinity of the current mine workings.

Underground haulages linking the Blanket and Lima ore shoots have provided platforms for horizontal core drilling at 100 m or 50 m centres to depths of 250 m either side of the haulage (Fig 13.1). This drilling led to the discovery of the two AR mineralized zones, the Sheet and Eroica deposits, all of which now form part of the mine's mineral resource inventory.

In addition to this practise of drilling both east and west of the main haulage, crosscuts into the hanging wall of the ore have been mined in order to establish drilling platforms from which to probe the down-dip extensions of the known ore shoots to allow for the estimation of resources.

More closely spaced horizontal drilling through the DSR ore bodies follows this primary exploration as the next step in generating the Measured Resources. These holes are drilled at 7.5 metre intervals from cubbies off a drive located in the centre and along strike of, the mineralized zone. If the mineralized zone is not expected to be more than several metres wider than the development drift, then evaluation of the sidewalls is carried out using percussion drill sludge sampling. The narrow quartz reefs rely on channel sampling alone for resource estimation since these zones are fully exposed by the development.

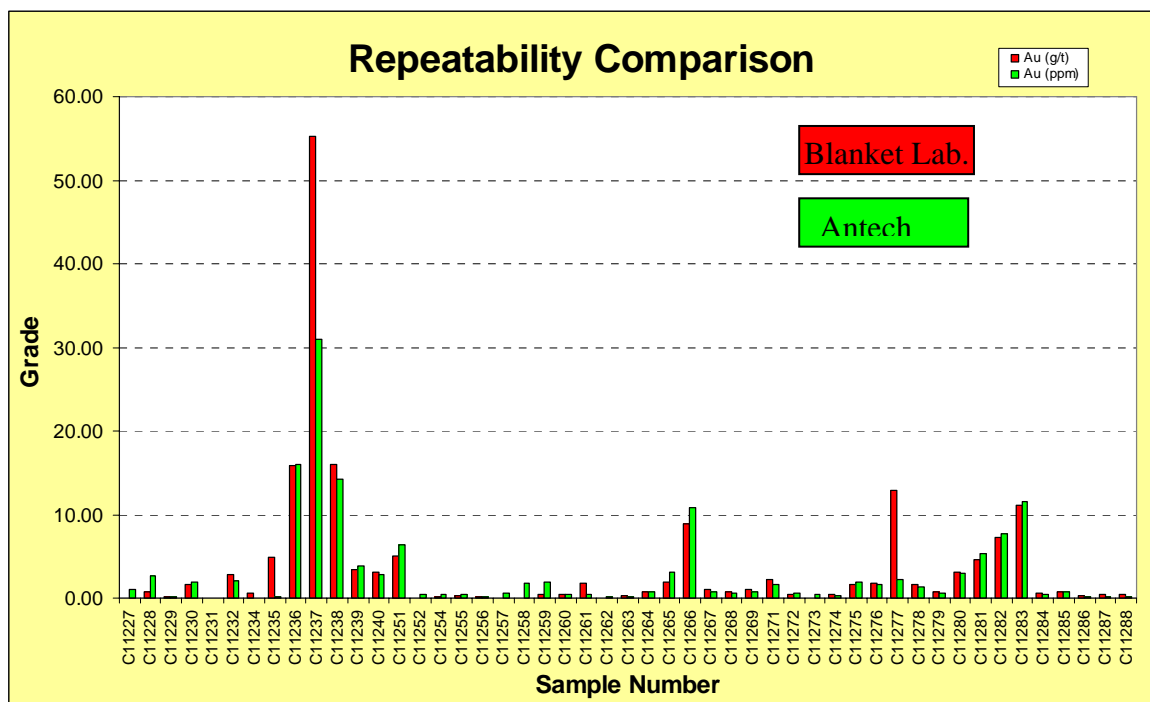




**Figure 13.1 Plans Showing Typical Exploration Drilling from the Main Haulage**

### 13.2 Exploration (Off-mine) Drilling

Blanket Mine owns a number diamond drilling rigs that are operated by mine staff. Surface holes are collared using NXC size rods and cased down to solid rock. Thereafter BQ size core is drilled as a standard. Core is transported back to the core yard at the mine where it is stored in a secure core yard. Although core boxes are wooden, they are stored on steel frames to avoid damage by termites.

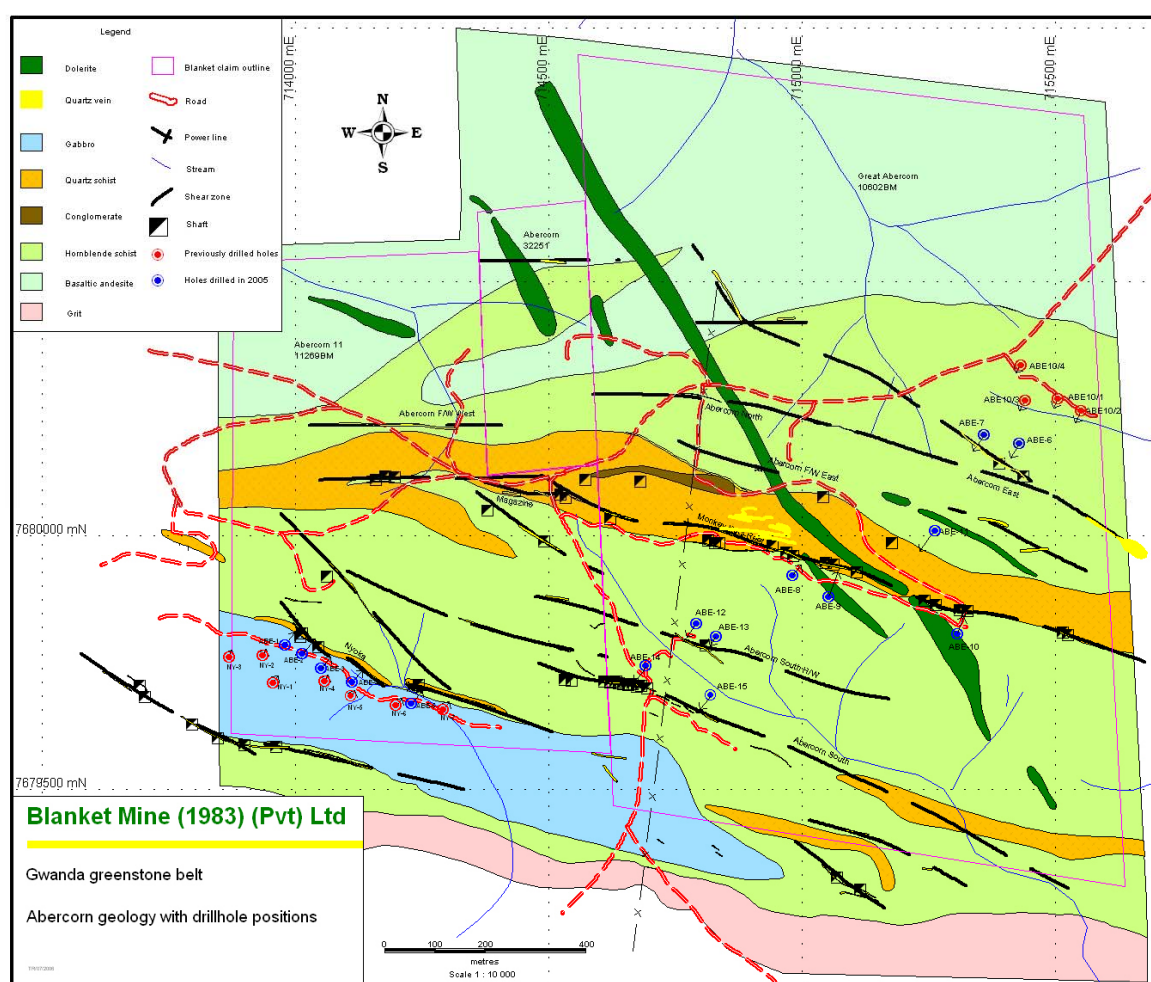


**Figure 13.3 Repeatability Comparisons of Assays from the Blanket Mine Laboratory and the Antech Laboratory**



All mineralised intersections are split prior to logging. Sampling of the split core is done according to geological contacts and features with the maximum sample being 60 cm in length. Half core samples are sent to Blanket Mine's assay laboratory for sample preparation and assay. Every 20<sup>th</sup> sample submitted for assay is an in-house standard. For the samples found to contain gold, the remaining half of the core is split, a quarter retained and a quarter sent to Antech Laboratory in Harare for check assay. The two sets of results are compared for anomalies and outliers. Figure 13.3 is an example of the comparison between assays performed by the mine laboratory and those carried out by Antech Laboratory.

Virtually all known mineralisation in the area has a near vertical attitude and tends to occur along shear zones. For this reason, boreholes are mostly laid out in rows along particular structures so as to pick up the strike extent of the mineralisation (Figure 13.2). A single strike or combination of strike lengths in excess of 100m is essential for a mineralised zone to be viable.



**Figure 13.2 Diamond Drilling Layout at the Abercorn Prospect**

## **14 SAMPLING METHOD AND APPROACH**

All Mineral Resource blocks have been generated from data obtained from underground core, channel (chip) sampling and/or percussion drill sludge sampling, with some deep diamond cored holes drilled from surface or from underground platforms.

In order to define Measured Resources, more closely spaced horizontal drilling in the DSR ore bodies follows the above primary exploration. These holes are drilled from cubbies in the sidewalls of the drives located in the centre and along strike of the mineralized zone. A hole spacing of not more than 7.5 m is required for the definition of Measured Resources. In the case of the DSR ore bodies in which the mineralized zone is not expected to be more than several metres wider than the development drift (drive), percussion holes are drilled every 2 m and the sludge sampled as an extension of the channel sampling pattern. The narrow quartz reefs rely on channel sampling alone for resource estimation.

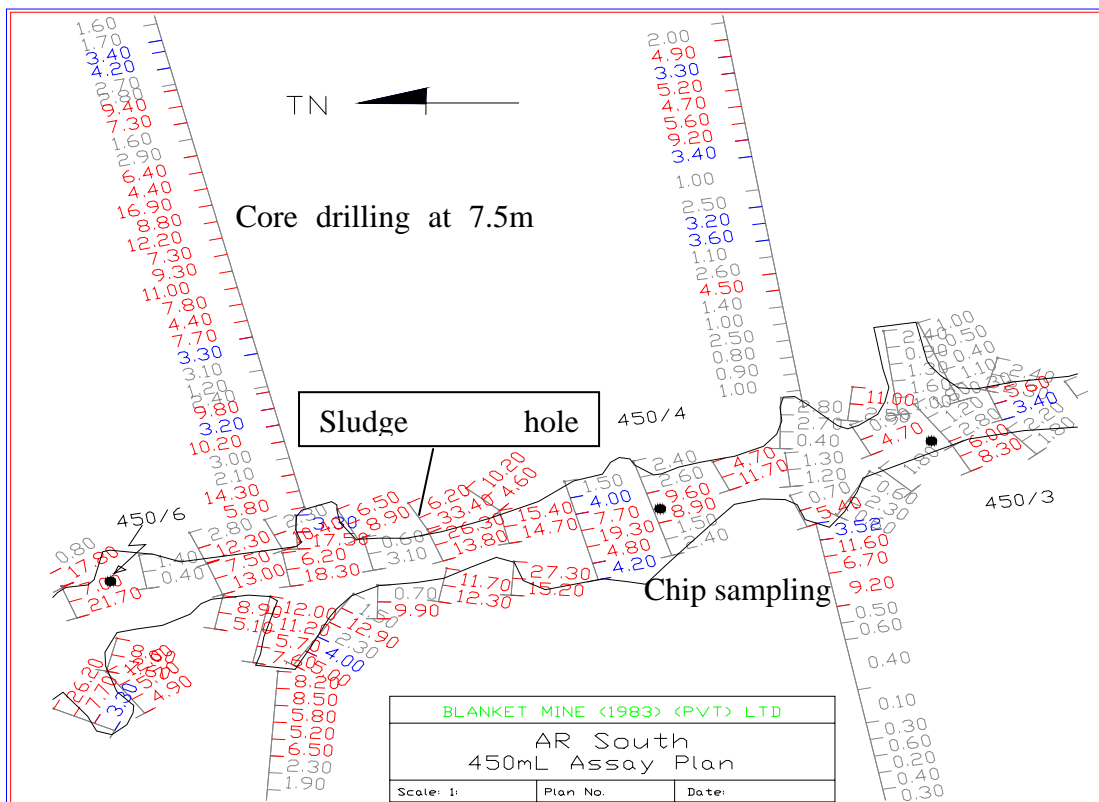
### **14.1 Channel and Percussion Drill Sludge Samples**

In addition to core drilling, the roof (back) of all primary development within mineralized zones is chip sampled along channels at 2 m intervals along strike (Fig.14.1). Where there are discrepancies between assay results and the visual grade estimation, a channel is cut across the mineralised zone with a diamond saw in order to improve the geometry of the sample groove.

In wider ore bodies where not all the mineralisation is exposed by the primary development, sidewall sludge holes are drilled to a depth of 1.2 m (Fig.14.1). Both chip and sludge samples are taken to give a complete section across the strike at standard 0.6 m intervals. In all of the mineralized zones, except the very wide AR Main and AR South bodies, only 4.2 m is sampled across the strike, and any mineralisation beyond these limits is not included in resource. The unsampled payable sections are nevertheless mined but reported as coming from not-in-reserve (NIR) blocks.

An exception to the standard 0.6 m channel sample interval occurs in the quartz shear deposits where lithology determines the sampled width when the vein is less than, or not a multiple of, 0.6 m.

Crosscuts through very wide ore bodies are treated in the same way as evaluation core drilling and the sidewalls are sampled at 0.60 m intervals.



**Figure 14.1 Typical Blanket Mine Assay Plan**

## 14.2 Diamond Drill Core Sampling

All cores are logged for rock type, structure, and alteration characteristics and ore minerals. For the long (250 m) horizontal and deep exploration holes, zones of mineralisation including arsenopyrite, pyrite, galena or pyrrhotite, are sampled at standard 0.6 m intervals, split with a diamond saw and sampled to ensure full coverage of the potential gold-bearing zones. The split core is then quartered with one quarter being sent to the mine laboratory and one to an independent laboratory. Where there are significant discrepancies between the results further assays are requested on the sample pulps.

Mineralized core from the short measured resource drilling is not split and the whole core is sampled at 0.6 m intervals (Fig.14.1). In the quartz shears lithological control supersedes the standard 0.6 m interval although a minimum of 1.2 m is sampled at each traverse or intersection.

## 14.3 Sample Handling and Monitoring

With the inherent problems of silicate loss with the fines upgrading the sample, and loss of particulate gold downgrading the sample, the accuracy of sludge sampling is questionable. The sludge samples are more than likely biased on the low side due to a loss of heavy minerals outweighing loss of silicates in the sampling process. While sludge sampling is relatively quick and cheap, the results need to be treated with caution. Applied Geology is of the opinion that if the samples are used for boundary

definition alone (when panning of sludge samples underground may be sufficient) then the practice could be continued.

Various measures are taken to ensure the validity and integrity of samples taken. Three types of sample bags are used as follows:

- Cloth sample bags are used in sludge sampling to allow for effective decanting of water while retaining the sample. Since more than one sample is taken from the sludge hole, the hole is flushed thoroughly with water before drilling and collecting the next sample.
- Plastic sample bags are used in continuous chip and grab sampling while paper bags are used for sampling on-site core. The above bags are used once and discarded to minimize contamination.
- A ticket tagging system is used with sketches drawn at the face showing the ticket numbers corresponding to the samples taken. On receipt from the laboratory, results are plotted on the assay plan against the corresponding ticket numbers. Based on these sketches, the sample data are digitised into the main database for ore body evaluation and modelling.

Blanket Mine ore bodies are visually distinguishable from the host lithologies and the degree of mineralisation can be visually estimated on a reef by reef basis with reasonable success. Mapping of development headings and stope benches are compared with the relevant assay data, and any suspect results or poor matches with the visual assessment is sent for check assay. Similarly, borehole core assay results are scrutinised with the logs in order to ensure that no obvious discrepancies occur.

## **15 SAMPLE PREPARATION, ANALYSIS AND SECURITY**

Gold assays for Blanket Mine are undertaken by an in-house laboratory on site and quality control procedures for checking the accuracy of assays are implemented. They include in-house standards for ore and milled samples including dump material. Five different laboratories in Zimbabwe have assayed these standards to establish their suitability and each batch of 32 samples contains one standard and one limestone blank.

An audit by AARL in 2000 concluded that the laboratory lacked strict quality control measures and made a number of recommendations to improve accuracy and accountability. Most of the AARL technical recommendations were implemented. An audit was done by J. Oleson of Fairbanks Gold Mining, Inc. in 2002. Comments on the outstanding issues mainly referred to documentation of quality assurance and quality control (QA/QC) procedures.

In addition, the core from the exploration drilling completed from the main haulage ways is split in half and then quartered with one quarter sent to the mine laboratory and one to an independent laboratory. Where there are significant discrepancies between the results further assays are requested on the sample pulps.

Applied Geology recommends that a full audit of the laboratory is undertaken in the near future to ensure continued accuracy of the assays and that it meets international standards as far as is practical in its current situation.

## **16 DATA VERIFICATION**

While on site, the Qualified Person was able to review the records of data, mineral reserve estimates and operating statistics in order to independently verify the quality of the data, any geological assumptions and the application of the modifying factors used to convert resources to reserves. Applied Geology considered that the record keeping was well maintained and the on-going conversion from paper to digital storage is providing a sound database for ore body modelling. Further, the company has adequate controls and security on its sampling chain of custody. AG did not consider that an independent sampling program was warranted given that the size of operation and the local variability of gold grade would require a substantial data set to be statistically meaningful.

The mine uses a system of factors to compare achieved grades and gold production to initial budget grades and forecast data. It is accepted that the Mine Call Factor, and Block Factors should be in the 90% range. Any comparison beyond the range of tolerance points towards a sampling exception, calling for attention (See Table 19.1).

AG has no reason to believe, given the reputation of previous operator of the Blanket Mine, that any historical data would be inadequate or erroneous. Over the past five years, data collection, resource estimation and mining practises have remained relatively constant. Applied Geology considers the data to present a reasonable reflection of the actual performance of the mine.

## **17 ADJACENT PROPERTIES**

Gwanda Greenstone Belt hosts three remaining big producers (>300oz Au per month) having once hosted no less than 268 operating mines at one time. The other two remaining operating mines are the neighbouring Vubachikwe Mine run by Forbes and Thompson and the Jessie Mine on the southeastern end of the belt and owned by F.A. Stewart and Son.

Vubachikwe Mine is the only adjacent property of consequence. While the remainder of the Gwanda Greenstone Belt is tied up by numerous claim and EPO holders, they are for the most part passive holders whose holding is largely as a result of their political alignment.

The proximity of Blanket Mine to Vubachikwe enabled it to buy and treat the Vubachikwe sand dumps through the Blanket metallurgical plant from 2000 to 2005. Vubachikwe Mine workings have reached a depth of at least 1000 m below surface compared to the 750 m depth at Blanket. Although the mines work separate ore bodies, the style of mineralisation is essentially the same so that a structural and genetic link between the two mines is very likely. Besides the confirmation that economic mineralisation can be expected to continue to at least a similar depth, there

is a possibility of cutting costs by rationalising the two operations should an economic link between the two mining camps be established.

## **18 MINERAL PROCESSING AND METALLURGICAL TESTING**

### **18.1 Metallurgical Plant**

The Blanket Mine process plant consists of a single process stream treating the ROM (run-of-mine) underground ore.

The process involves three-stage crushing which has a feed size of 350 mm producing a final product of 80% passing 8 mm. This product is fed into an open circuit 12' x 6' rod mill at a rate of 24 tph. From the rod mill the discharge combines with the 16'x12'regrind mill product and is pumped to two 30" CD-Knelson Concentrators that are connected in parallel. Knelson Concentrates are further treated on the Gemini table to produce a much cleaner concentrate which is calcined before smelting on site. Knelson concentrate tails are pumped to a hydro cyclone where the underflow is fed to the 16'x12'regrind mill and the overflow is allowed to gravitate to the Delco screen for trash removal before pumping it to a set of 8-10mm dewatering cluster cyclones.

Dewatering of the hydro-cyclone overflow to 50% solids is undertaken before feeding it into the ROM CIL (carbon-in-leach) head tank. Six by 572m<sup>3</sup> tanks comprise the CIL.

Loaded carbon from the CIL head tank is washed before it is eluted and electro won in a compact PG Elution cell. Cathodes from the cells are acid digested and calcined before smelting on site. Tailings from the CIL circuit are passed through a cyanide destruction system before being pumped to the tailings dam with the effluent being recycled to the plant. The plant flow sheet is presented in Figure 18.1.

### **18.2 Metallurgical Testing**

Blanket Mine has a long and well established track record in as far as metallurgical treatment of the various ores is concerned. Over the period of operation of the current metallurgical plant, Blanket Mine has achieved recoveries of between 88% and 92% of gold delivered to the plant. This is a good metallurgical recovery for a greenstone mine and hence metallurgical testing has been restricted to refinements in milling, reagent usage and reaction times.

On average, approximately 40% of the gold is recovered as free gold, the remaining portion being contained within sulphide the minerals, pyrite, pyrrhotite and arsenopyrite. The quartz ore bodies are characterised by even higher proportions of free gold while the disseminated sulphide replacement ores have only small amounts of free gold. Assuming that the gold recovery from the quartz-rich ores is higher than from the sulphide ores, it follows that lower recoveries (between 85% and 90%) are likely for the sulphide ores.

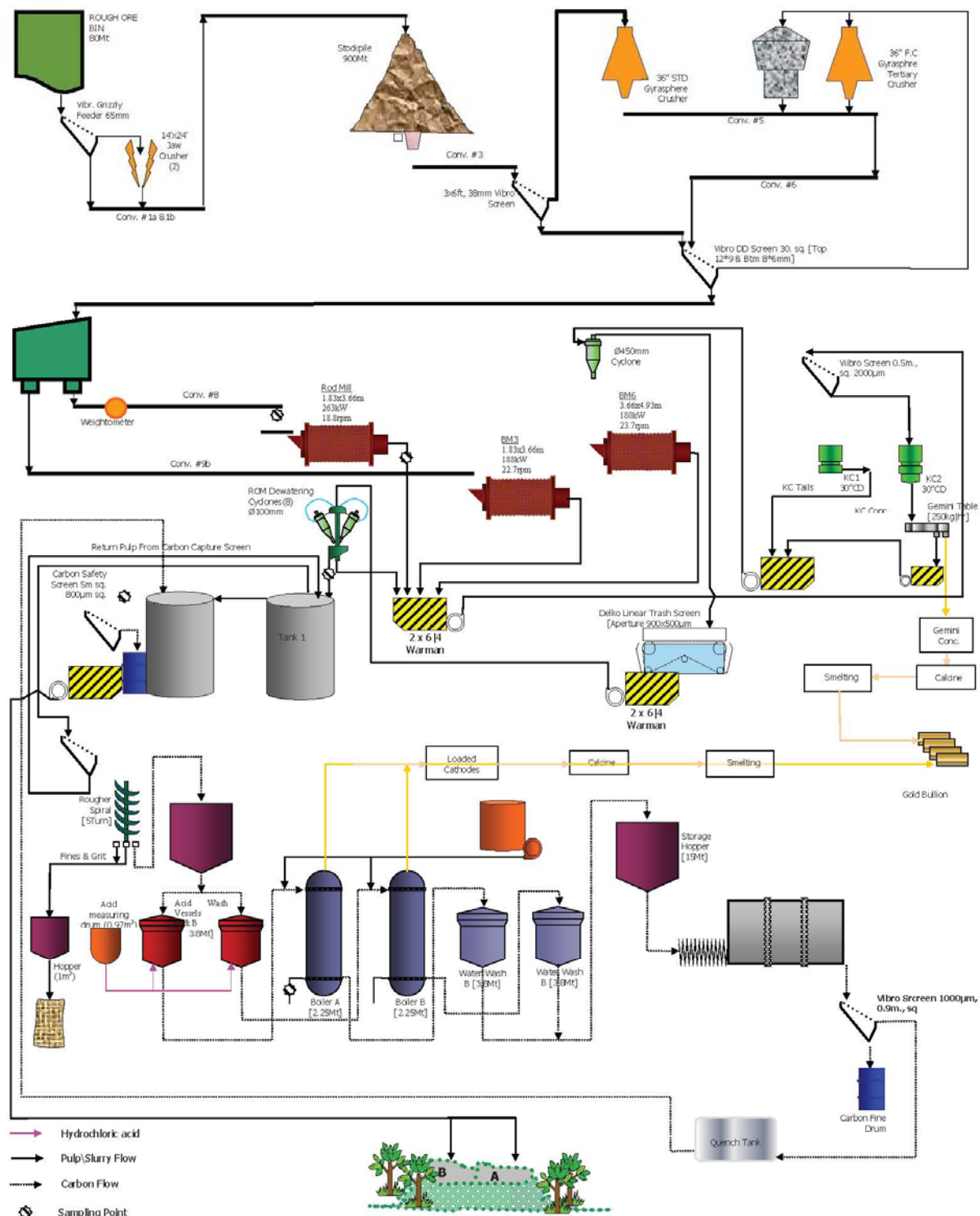


Figure 18.1 Blanket Mine Metallurgical Flow Sheet

**Table 19.1 Summaries of Mineral Reserves and Resources for Blanket Mine,  
30 June 2006**

**MINERAL RESERVES (@Au price US\$500/oz)**

<b>Classification</b>	<b>Tonnes</b>	<b>Grade Au g/t</b>	<b>Content (kg)</b>	<b>Content (oz)</b>
<b>PROVEN ORE</b>				
Operating Areas	917,200	3.96	3,628	116,640
Pillars (discounted by 50%)	247,600	4.59	1,137	36,560
Blanket Tailings	145,600	1.63	237	7,620
Total Proven Ore including Pillars	1,310,400	3.82	5,002	160,820
<b>PROBABLE ORE</b>				
Operating and Development Areas	2,326,000	4.10	9,540	306,700
<b>Total Proven +Probable Ore</b>	<b>3,636,400</b>	<b>4.00</b>	<b>14,542</b>	<b>467,500</b>

**Note:** For Proven ore, tonnages are rounded to nearest 100 and ounces to nearest 10; for Probable ore, tonnages are rounded to the nearest 1000, ounces to the nearest 100 and kilograms to the nearest 10.

**MINERAL RESOURCES (@Au price US\$500/oz)**

<b>Classification</b>	<b>Tonnes</b>	<b>Grade Au g/t</b>	<b>Content (kg)</b>	<b>Content (oz)</b>
<b>Indicated</b>	380,000	4.12	1,600	51,000
<b>Inferred</b>	2,400,000	5.91	**	**

**Notes:** Indicated Resource tonnages have been rounded to the nearest 10 000, ounces to the nearest 1000 and kilograms to the nearest 100; Inferred resource tonnages have been rounded to the nearest 100 000:

\*\* - In keeping with the requirements of NI 43-101, Inferred Resources are reported without estimates of metal quantities.

## **19 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES**

The Financial Year for Blanket Mines ends in December and includes an annual review and update of the Mineral Reserves and Resources. The estimation of Mineral Resources and Reserves reviewed in this report is an interim estimation necessitated by the acquisition of the mine by Caledonia Mining Corporation. The estimation was completed by mine personnel following methodology discussed in detail below (see Table 19.1).

The resources and reserves have been classified according to the requirements and standards as detailed in the “CIM Standards on Mineral Resources and Reserves: Definitions and Guidelines”.



## **19.1 Key Assumptions, Methods and Parameters**

### **19.1.1 Geological**

Greenstone gold deposits are known from the Archaean terrains of Canada, Australia, Southern and Northern Africa and India. These deposits have broadly similar characteristics and were formed in essentially the same manner. Consequently, the principles governing their valuation are generally applicable to deposits of this type.

Archaean gold deposits are characterised by:

- Extreme fluctuations in grade;
- Irregular ore body geometry;
- Focussing of economic grades into discrete shoots;
- Strong vertical continuity of mineralisation; and
- Erratic free gold concentrations.

Some or all of the above characteristics need to be taken into account when evaluating mineral resources and reserves in this type of deposit. Often the nature of gold occurrences in nearby mines with similar styles of mineralisation and lithological associations may help identify patterns of grade distribution and continuity, especially with regard to the behaviour and characteristics of deep gold mineralisation.

For the purposes of Resource estimation, the Blanket ore bodies are identified as having near vertical attitudes with strong vertical grade continuity but limited lateral grade continuity. The shoots may be tabular or rounded in cross section and the method of gold grade estimation is dependent on the shape of each shoot. There is further no indication that the mineralized zones terminate with depth but they do pinch and swell to the extent that they are not continuously economic. The major source of resources at present is the AR shoot complex, a twin shoot ore system that extends to depth beyond current drilling information but did not extend to surface, i.e. a blind ore body.

### **19.1.2 Economic Factors**

Reserves and Resource estimates have been estimated based on current information as at 30 June 2006. Estimates have been made using a gold price of US\$ 500 per ounce and the US\$ / Zimbabwe \$ exchange rate of 1:101159 as set by the Zimbabwean Government. The Zimbabwean economy is complex with artificial constraints set by the Zimbabwean Government. These are discussed in some detail later in this report. See Section 25.3.

However, subsequent to the preparation of these Resource estimates, the government of Zimbabwe announced sweeping financial reforms, including increasing the gold price received by producers to the spot price, increasing the percentage of revenue that can be earned in hard currency to 75% (40%) as well as giving it indefinite life (30 days), and dropping three zeros off the currency unit to allow easier money handling. These changes will have a positive impact on the Blanket Mine's viability but until the national inflation (currently over 1000%) is brought down to manageable

levels, they do not represent a permanent turn in the economic well-being of operation.

### **19.1.3 Mining Factors**

Blanket Mine is typical of a small greenstone gold mine (approximately 20,000 t/month) in that the ore bodies vary in habit and mining practices are developed to suit the specific attributes of the ore shoots. In this way, a variety of mining methods may be applied simultaneously on the same mine. The various mining practices employed at Blanket Mine are detailed under Section 25.1 Mining Operations.

#### **19.1.3.1 Stopping Methods**

Shrinkage, underhand benching and longhole open stopping are practised at Blanket Mine depending on the shape and attitude of the various ore shoots. For both safety reasons and ease of mining, longhole open stopping is used only for massive ore bodies which have relatively competent wall rocks that can withstand the considerable shock of the blast holes. Quartz-filled shear reefs on the other hand are narrow and have well sheared margins and as such the stopes are better controlled by shrinkage mining where the broken rock supports the sidewalls until such time as the stope is drawn down. In this way, a relatively uniform success rate in minimising dilution and maintaining grade is achieved with various ore shoots such that a uniform pay limit can be applied to most ore shoots.

#### **19.1.3.2 Dilution**

Reserve tonnages are expressed inclusive of internal waste and diluting materials. Dilution is determined from the reconciliation of previously mined blocks which gives an average of 7.5% for the whole mine. A universal dilution of 7.5% has been applied in all cases although the dilution varies as a percentage from one ore shoot to another. Applied Geology considers this figure to be a fair representation for the whole operation but it could be more accurate if different factors were estimated for the different types of orebody exploited by the mine. Strictly, a uniform skin thickness factor would provide a better estimate of the actual dilution encountered.

For the purpose of Reserve grade estimation, the applied dilution is assigned a zero grade. This has the effect of overcompensating since nearly all mineralized zones have a gradational grade profile as the margin is approached. Conservatism in this area is likely to be offset by possible grade overestimates due to the tendency to concentrate sampling in development along the higher grade zones of mineralized shears.

### **19.1.3.3 Metallurgical Recovery**

Blanket Mine has a long and well established track record in as far as metallurgical treatment of the various ores is concerned. On average, approximately 40% of the gold is recovered as free gold, the remaining portion being contained within sulphide the minerals, pyrite, pyrrhotite and arsenopyrite. The quartz ore bodies are characterised by even higher proportions of free gold while the disseminated sulphide replacement ores have only small amounts of free gold.

Over the period of operation of the current metallurgical plant, Blanket mine has achieved recoveries of between 88% and 92% of gold delivered to the plant. This is a good metallurgical recovery for a greenstone mine and reflects the effects of high grade metamorphism of the ores. Typically higher grades of metamorphism of greenstone ore bodies results in aggregation of minute particles of gold into particles that can be liberated by milling. In addition, gold micro-particles within the sulphide grains also appear to coalesce and are more readily liberated or dissolved following the milling process. The factors work in Blanket's favour and allow for the application of a low pay limit for all the ore bodies at Blanket Mine.

### **19.1.4 Sources of information**

The most striking characteristic of the Blanket Mine operations is the long history of mining, providing mine staff the experience and knowledge with which to complete the resource estimates.

While on site, AG was able to review the data records of, mineral reserve estimates and operating statistics in order to independently verify the quality of the data, any geological assumptions and the application of the modifying factors used to convert resources to reserves. It was considered that the record keeping was well maintained and that the on-going conversion from paper to digital is providing Blanket Mine with an essential database. Further, the company has adequate controls and security on its sampling chain of custody. AG did not consider that an independent sampling program was warranted given the size of operation and the local variability of gold grade that would require a substantial check data set to be statistically meaningful. Accordingly, AG reviewed historical operating statistics to ensure that the calculation of modifying factors to convert resources to reserves were appropriate. AG considers that the base sampling data and the resulting modifying factors are reliable for the estimation of mineral reserves, the development of the mine plan and the projection of cash flows.

In addition, AG conducted some random calculation checks to ascertain whether the data are reliable for resource estimation. AG has no reason to believe from the high standards of data collection and recording established by the previous owners of Blanket Mine, that any historical data would be inadequate or erroneous. Over the past five years, data collection, resource estimation and mining have remained relatively constant.

### 19.1.5 Data Processing

The estimation of Mineral Resources for the underground operations has been completed by mine personnel. In general, the resource estimation process is based on data derived from surface and underground drilling, chip sampling and sludge sampling.

All of the Resources and Reserves are estimated manually although there is progress towards converting this system to a computerised version using Surpac Vision software.

AG has not recalculated mineral resource estimates for each asset. AG has, however, examined this methodology and checked calculations and, where appropriate, made necessary adjustments to the estimates to derive the resource estimates presented herein.

The resources/reserves have been classified according to the “CIM Standards on Mineral Resources and Reserves: Definitions and Guidelines” (August, 2000). Accordingly, the Resources have been classified as Measured, Indicated or Inferred Mineral Resources. The mineral resources have been classified essentially on the density of the drill hole data and the continuity of the geometry and grade of the mineralisation.

## 19.2 Mineral Resources

A Mineral Resource is a concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the Earth’s crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

Mineral resources at Blanket Mine are defined according to the spacing of underground sampling and borehole information and are illustrated in Figure 19.1. Resources are categorised as **measured** when they lie between levels with a maximum vertical distance of 15m. Sampling on the levels is by chipping, groove sampling, and sampling of horizontal sludge hole and diamond drill core. Diamond drill holes must lie within a maximum separation distance of 7.5m, and sludge holes have a spacing of 2m.

Resources are categorised as **indicated** when they lie within a maximum vertical distance of 30m of underground evaluation sampling, horizontal sludge and diamond drilling, which may lie only on the top or bottom side of a block. Horizontal spacing of boreholes may be between 7.5m and 30m.

Resources are categorised as **inferred** when they have been intersected by core holes between 30m and 60m along strike and between 30m and 120m down dip. Down dip continuity at two times strike is taken from the known geometry of pay shoots on

other ore bodies (Jethro and Blanket No.1) which have tapered outlines with known depths three to four times maximum strike.

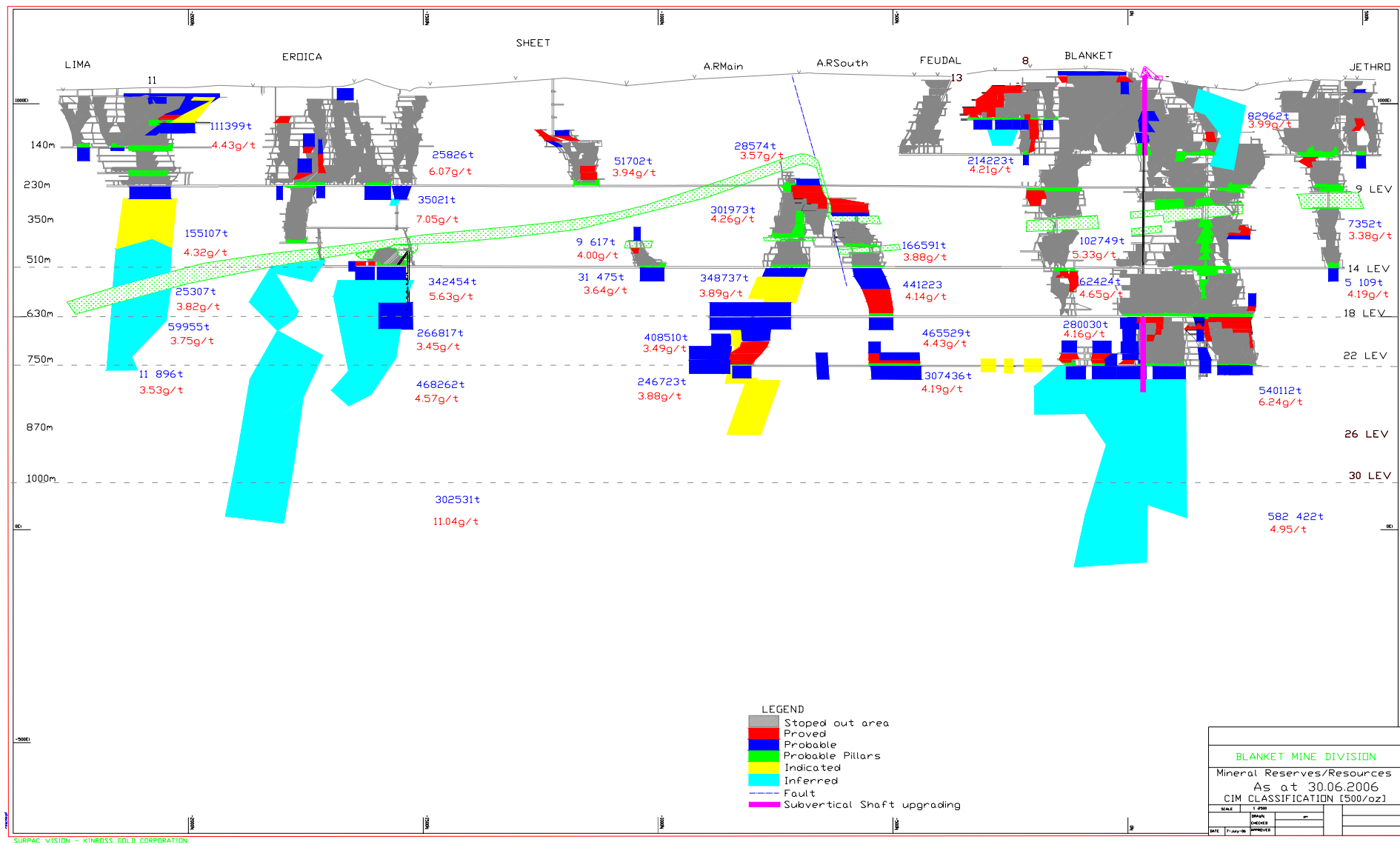
No Measured Resources are considered in the Reserve and Resource estimates for June 2006. This is because all Measured Resources to date have been estimated from underground localities in the vicinity of current mining activity, and have been immediately incorporated into the Proven and Probable Reserve categories with the application of a cut-off grade. Those portions excluded are neutralised by the mining method and are not considered a resource once extraction of the ore body has taken place.

Grades of mineral resource blocks at Blanket Mine are calculated from the arithmetic average of the sample grades weighted by the sample width. Tonnages are the product of the volumes defined by the borehole intersections and underground sampling, and the specific gravity factor of 2.86. Comments regarding the representivity of this one value as for all ores exploited by Blanket Mine are made in Section 19.6.1.

The following exceptions limit the distance of a resource block boundary from a sample point:

1. Where the 60 m limit exceeds the strike confines of the pay shoot defined by existing up-dip mining limits;
2. Where peripheral intersections suggest a significant thinning of the mineralised zone;
3. Where unmineralised holes indicate termination of the mineralised zone. In this instance the boundary is taken halfway between the mineralised and non-mineralised intercepts, with the restrictions of pay shoot boundary taking precedence;
4. Where projected geological features (e.g. dykes and faults) are likely to affect the mineralised zone.

The above parameters for defining resources at Blanket Mine are considered by Applied Geology to lie within the levels of confidence required by the National Instrument 43-101 for the different categories of resource, and will provide a generally conservative estimation. This is particularly true of the inferred resource category where ore shoots are projected a maximum of 120m beyond a borehole intersection in the direction of mineralised shoot development. In Archaean environments such as that at Blanket Mine, ore shoots are known to continue to considerably greater depths, e.g. the neighbouring Vubachikwe mine is mining shoots which extend to 1,200 m in depth. In view of the drill-indicated nature of these resources, AG regards them as being a valid part of the mineral inventory although they have not been considered for purposes of the financial model and business plan.



**Figure 19.1 Longitudinal Projection showing Reserve and Resource Blocks**

## **19.3 Mineral Reserves**

Mineral reserves at Blanket mine are based on the economic parameters demonstrated by the ongoing profitability of the mining operations. Reserves have been estimated for a cut-off grade of 2.15 g/t (see Table 19.1) and are illustrated in Figure 19.1. It has been demonstrated by the mine that these reserves can be extracted profitably using underhand, overhand, shrinkage and long-hole stoping techniques.

### **19.3.1 Relationship between Reserves and Resources**

Proven and Probable mineral reserves are expressed additional to the Indicated and Inferred mineral resources with which they are reported.

### **19.3.2 Probable Mineral Reserves**

Reserves are categorised as probable when they have been sampled on one level. Sampling on the level is by chipping, groove sampling, and horizontal sludge hole and diamond drilling. Diamond drill holes may have separation distances of between 7.5m and 30m. Horizontal boundaries to the reserve blocks are established by applying a cut-off grade of 2.15g/t to the sample value distribution, and calculating the area within the boundaries using a planimeter. The block boundaries may be adjusted to accommodate local irregularities in the boundary trace that would normally be avoided or dishonoured during mining. Volumes are estimated by projecting the area vertically up or down, or both for a maximum distance of 30m and multiplying by the distance of the vertical projection. The *in situ* tonnage of the block is determined using a specific gravity of 2.86 and the grade estimated by the arithmetic average of the samples within the block, weighted by the individual sample widths.

### **19.3.3 Proven Mineral Reserves**

Reserves are categorised as proven when they lie between levels which are separated by a maximum vertical distance of 15m. Sampling on the levels is by chipping, groove sampling, and horizontal sludge hole and diamond drilling. Diamond drill holes must lie within a maximum separation distance of 7.5m, and sludge holes have a spacing of 2m, equivalent to the spacing of chip sampling. Horizontal boundaries to the reserve blocks are established by applying a cut-off grade of 2.15g/t to the sample value distribution, and calculating the area within the boundaries using a planimeter. The block boundaries may be adjusted to accommodate local irregularities in the boundary trace that would normally be avoided or dishonoured during mining. Volumes are estimated by averaging the top and bottom areas of the blocks and multiplying the average area by their vertical separation. The *in situ* tonnage of the block is determined using a specific gravity of 2.86 and the grade estimated by the arithmetic average of the samples within the block, weighted by the individual sample widths.

### **19.3.4 Reconciliation of Ore Reserves**

An ongoing reconciliation of Reserves and Resources is maintained by the mine staff. Production depletion is recorded in terms of both tonnage and grade with additions due to successful exploration activities, and losses or gains due to changes in pay limit (gold price or cost driven). Engineering changes reflect all variances as a result of engineering factors including gold price assumptions, mine design changes, changes in metallurgical recovery assumptions, changes in operating costs or any other factor related to engineering. Table 19.1 presents the Reserve and Resource reconciliation for the half year to June 2006.

As indicated in the above discussion most of the changes involve the upgrading within the Reserve category and of Measured Resource to Proven Reserve categories as additional information is obtained regarding the valuation of the mineralised zones. Additions to Resources are as a result of upgrading low grade mineralised zones to the Resource category based on the higher gold price and lower pay limits used.



**Table 19.2 The Mineral Reserve and Mineral Resource Balance, January to June 2006**

Classification	Opening Balance			Production Depletion			Exploration Change			Engineering Change			Closing Balance		
	Tonnes (x1,000)	Grade (Au g/t)	Ounces (x 1,000)	Tonnes (x1,000)	Grade (Au g/t)	Ounces (x 1,000)	Tonnes (x1,000)	Grade (Au g/t)	Ounces (x 1,000)	Tonnes (x1,000)	Grade (Au g/t)	Ounces (x 1,000)	Tonnes (x1,000)	Grade (Au g/t)	Ounces (x 1,000)
Proven	1,118.0	4.19	150.7	(55.7)	4.69	(8.4)	100.8	3.36	10.9	1.7	3.09	0.2	1,164.8	4.09	153.4
Probable	2,105.0	4.27	288.9	-	-	-	237.6	2.60	19.9	(16.4)	4.22	(2.2)	2,326.2	4.10	306.5
Stockpile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	3,223.0	4.24	439.6	(55.7)	4.69	(8.4)	338.4	2.83	30.8	(14.7)	4.35	(2.1)	3,491.0	4.10	459.9
Measured	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indicated	431.0	4.06	56.3	-	-	-	(53.8)	3.63	(6.3)	-	-	-	377.2	4.12	50.0
Subtotal	431.0	4.06	56.3	-	-	-	(53.8)	3.63	(6.3)	-	-	-	377.2	4.12	50.0
Inferred	2,064.0	6.31	418.7	-	-	-	-	-	-	311.1	3.20	32.0	2,375.1	5.90	450.7
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	2,064.0	6.31	418.7	-	-	-	-	-	-	311.1	3.20	32.0	2,375.1	5.90	450.7
TOTAL	5,718.0	4.97	914.6	(55.7)	4.69	(8.4)	284.6	2.67	24.5	296.4	3.14	30.0	6,243.3	4.79	960.6
Comments															
Proven	The gain of 100.8 kt is largely from development at AR South above both 22 Level and 18 Level.														
Probable	The gain of 237.6 kt is a result of developing both the AR South and AR Main above 22 Level and 18 Level.														
Measured	Nothing to report.														
Indicated	The loss of 54 kt at AR Main between 18 and 22 Levels is as a result of upgrading into Reserves.														
Inferred	The gain of 311.1 kt is from Eroica below 22 Level as a result of change in cut-off due to the higher Au price of US\$500/oz used.														

NOTE: Pillars are discounted by 50% and included in the Proven Category

## 19.4 Discussion

The resources are estimated somewhat differently by zone depending on the overall deposit geometry. Initially, all of the deposits are drilled at 100 m or 50 m centres. Subsequently, development drifts along the ore body provide an opportunity to chip or channel sample the backs of the development drifts at 2.0 m intervals, particularly for deposits where the width of the mineralisation is less than the underground drift of 1.8 m. However, if the mineralized zone is much more than several metres wider than the development drift, such as the AR Main and AR South deposits that comprise the majority of the resources, sampling along crosscuts is supplemented by horizontal core holes drilled at 7.5 m intervals along the deposit, in order to define the extent of the mineralisation. While satisfying the criteria for Measured Resources, the resultant data density is not ideal, viz.

There is an imbalance between drill and channel information with channels taken every 2.0 m against minimum drill spacing of 7.5 m, and therefore, a greater number of high grade samples could be used to estimate grades in the less frequently sampled lower grade mineralisation along the margins of the deposit.

However, in zones where the mineralisation is only marginally (i.e. several metres) wider than the development drift, the chip and channel sample information is augmented with short, 1.2 m percussion holes drilled horizontally from each side of the drift and sludge samples are collected. There are several potential problems with using sludge samples taken from percussion holes, including:

With the inherent problems of silicate loss to fines upgrading the sample, and the loss of particulate gold downgrading the sample, the accuracy of sludge sampling is questionable. More than likely, the sludge samples are biased on the low side due to a loss of heavy minerals that outweighs the loss of silicates in the sampling process.

Where sludge sampling is employed to sample mineralized zones wider than 4.2 m (i.e. the width of the development drift plus 1.2 m sludge sample on either side) the excluded margins of the mineralisation remain unsampled and therefore are not included in the resource. However, in practice, the mine actually recovers this additional material, referred to by the mine as “Not-in-Reserve” (NIR). This material can add up to 10% of the mined tonnage and, because it is located along the margins of the deposit, probably results in additional tonnage but at a marginally lower grade than the reserves mined along the core of the mineralized zone.

However, the mine currently completes a metal reconciliation between in-stope sampled tonnages and delivered tonnages at the mill, providing an opportunity to assess the quality of the resource and reserve estimates and the appropriateness of the various modifying factors such as dilution and mine call factors (MCF) (see Table 19.1). Applied Geology is satisfied with mine’s ability to estimate the resources and recover the estimated reserves. A long history of mining in the area has provided staff with the experience and knowledge with which to prepare reliable estimates of the mineral resources.

The long history of mining has also provided an opportunity to reconcile the mineral resources with actual production statistics. Although on occasion the local estimates may be unreliable due to local sample bias (whether it be high or low), or unrepresentative sampling from the higher grade core of the deposit compared to the less sampled lower grade envelope, Applied Geology is of the opinion that the global resource estimate is reliable given the various modifying factors including dilution, grade capping and mine call factors.

A cut-off grade of 2.18 g/t Au for determining the limits mineralized zone is arrived at by calculating zero-based operating costs, and applying a mine call factor, mill recovery and the gold price. In addition, individual high values are capped at approximately the 90 percentile grade distribution for each mineralized body, and varies from 8.0 g/t Au for the BF deposit to 24.0 g/t Au for the Eroica deposit. The 90 percentile limit is determined individually for each ore body based on the cumulative frequency distribution of all assay data for the period under review.

## **19.5 Discussion on Grade Management**

### **19.5.1 Grade Control**

In the wider DSR ore bodies, development through the deposit is followed by 'trailing' to the pay limits guided by sludge drilling. Assay results are plotted and communicated to the miners at the face. In addition, the responsible geologist routinely monitors each face to make a visual assessment of grade from the sulphide concentration in the rock.

For the under- and overhand stopes, bench faces are channel sampled across the stope width after every second blast, with visual control from the geologist. Again, assay results are plotted on a stope assay sheet and are immediately communicated to production officials at the face.

In addition, all the producing box-holes and draw points are grab sampled over the shift by taking a shovel-full of ore from the corners and centre of each loaded Granby car. These samples are composited and split for assay and a computation is performed to determine the trammed grade for the day. Any anomalous results are investigated and remedial action taken where necessary.

### **19.5.2 Grade Reconciliation**

The Blanket Mine monitors its performance through a number of factors based on the following:

- Stope and development survey tonnes
- Stope grade based on in-stope channel sampling for underhand benching and overhand shrinkage stopes
- Stope grade in some wide ore bodies based on 'trailing' development to ore body limits

- Review of any in-stope sampling

Further sampling points through the tramming and plant stream include:

- Underground Granby car sampling
- Weightometer mass measurement after primary crushing
- Automatic belt sampling after primary crushing
- Automatic sampling of the tailings

Many of these factors provide essential daily and monthly controls and over longer periods of time a realistic mine call factor (MCF). Table 19.3 presents the MCF calculated on the classical southern African definition of 'gold called for' (gold content from underground survey and sampling) versus gold recovered plus residue.

**Table 19.3 Mine Call Factors from 1998 to 2006**

Year	Milled Tonnes	Gold	Gold in Tails	Gold Accounted For	Total Mined	Mined Grade	Gold Called for	MCF
		Recovered						
		oz	oz	oz	t	g/t Au	oz	%
1998	215,580	24,194	3,604	27,798	216,330	4.56	31,716	88%
1999	205,330	22,838	2,839	25,677	199,787	4.27	27,427	94%
2000	193,300	23,725	2,859	26,584	187,466	4.34	26,158	102%
2001	195,400	24,748	3,204	27,952	176,625	4.71	26,746	105%
2002	179,891	26,773	3,236	30,009	178,329	5.19	29,756	101%
2003	173,700	24,525	2,234	26,759	165,887	4.8	25,600	105%
2004	178,896	24,119	2,416	26,535	185,302	4.6	27,405	97%
2005	212,319	24,783	2,867	27,650	212,176	4.05	27,628	100%
2006 <sup>#</sup>	99,361	11,685	1,342	13,027	94,824	4.08	12,439	105%
Tot/Ave	1,653,777	207,390	24,601	231,991	1,616,726	4.67	234,875	99%

<sup>#</sup> to June 2006

The average MCF for the past eight years of 99% (range 88% to 105%) indicates that the mine has a typical gold accounting record and that the underground survey and sampling compare reasonably well with the mill recorded production. The high values from 2000 to 2003 are possibly due to incorporation of some of the Vubachikwe tailings recovery into the hard rock circuit, but the MCF's both prior to and after this period are as expected for a mine of this type.

### **19.5.3 Cut-off grade**

Reserves have been estimated for a cut-off grade of 2.15 g/t which has been estimated taking into account a gold price of US\$500 per ounce (currently US\$640/oz), mining costs, dilution, mill losses, the natural grade boundaries to the mineralisation and general operational experience. The cut-off grade also provides some rigidity to the economic mining parameters within the mercurial state of the Zimbabwe economy, whilst minimising the losses of marginal ore.

## **19.6 Other Factors**

### **19.6.1 Specific Gravity**

The specific gravity of ore has been determined to be 2.86. This was the average of 174 samples measured during a study undertaken by the University of Zimbabwe in 1994. The mine average bulk density measurements applied to all mineralized zones should be investigated further as it is unlikely that a well-mineralised DSR ore has the same density as material from a quartz shear or ore from the AR bodies. In 2002, SRK recommended that over a period of time all assayed sections of core be measured for density to ascertain the variation and to determine if there is any correlation between grade and density. Applied Geology concurs with these comments and recommends that densities should be determined for the different ores exploited by Blanket Mine, and the adopted values be reviewed regularly by routine SG measurements of evaluation samples.

### **19.6.2 Mining**

Blanket Mine is typical of Archaean Greenstone Belt mines which generally exploit steep tabular to massive ore bodies via underground mining methods. The methods employed are dependent on the characteristics of the specific shoot and target safe and efficient extraction. The methods employed by Blanket Mine are explained in Section 25.1: Mining Operations.

### **19.6.3 Metallurgical**

On average, approximately 60% of the gold recovered by Blanket Mine is associated with sulphide minerals, pyrite, pyrrhotite and arsenopyrite. These minerals are most abundantly developed in the disseminated sulphide replacement ore (DSRs) which represent the greater part of the Reserves. Quartz ore bodies are characterised by high proportions of free gold most of which is recoverable via the Knelson Concentrators.

The metallurgical process installed at Blanket Mine is described in Section 25.2: Recoverability. Briefly, the process involves crushing and milling to 80% minus 75 micron, followed by the Knelson Concentrators which act as the gravity circuit. Pulp from which the gold particles have been removed but which still contain gold-bearing sulphides passes to the Carbon-in-Leach (CIL) circuit where cyanide is added to dissolve the gold. The dissolved gold is absorbed onto activated carbon from which it is then eluted, plated onto cathodes, calcined and smelted. Over the period of

operation of the current metallurgical plant, recoveries of between 88% and 92% have been achieved.

In general terms, the Blanket ores are relatively easy to treat and don't present any problems which can significantly affect the viability of the mine. This works in Blanket's favour and allows for the application of a low pay limit for all the ore bodies at Blanket Mine.

## **20 OTHER RELEVANT DATA AND INFORMATION**

### **20.1 Risks**

The main risk is the current fiscal environment in Zimbabwe. Unpredictable, very high inflation and the gold 'support price' could have negative impacts on the Blanket Mine's viability. Given a realistic exchange rate and the current gold price the mine would be very profitable.

A potential risk facing all mine owners in Zimbabwe is the threat of nationalisation. While this idea was mooted in early 2006, no action has been taken. On the contrary, the slide in gold production from 6.4 tonnes for the first 5 months of 2005 to 4.3 tonnes for the same period in 2006 appears to have persuaded the Reserve Bank to ease controls on gold mines because of their importance as sources of foreign exchange.

Another risk that has been identified is the limited hoisting capacity. The deepening of the revised shaft system to avoid the current triple transfer system through sub-vertical and incline shafts has been completed. However, equipping is still in progress and has been delayed by a shortage of foreign currency required to purchase steel and equipment. The current mine plan estimates that equipping will be complete by Q1, 2007 and that commissioning of the deepened shaft will take place before mid 2007. The delay in building up the production rate to 1,000 tonnes per day from underground has had significant financial implications and further delays cannot be ruled out.

A further risk, but one that can be avoided with adequate vigilance, is the potential for theft of gold. Nearly half of the Blanket Mine's production comes from free gold and the economic hardships in Zimbabwe have spawned a thriving artisanal gold panning industry, and with it, robust pipelines for the illegal export of gold.

### **20.2 Opportunities**

The Blanket Mine is a well established mine that has been in operation for close to 100 years. The infrastructure is therefore well established to service the mining operation. Most of the staff has been at Blanket for 20 years and more. This not only demonstrates the loyalty of the workforce but also the fact the management structure is effective and has a good rapport with the workforce.

The main opportunity is to increase the Mineral Resource base with further drilling, as all of the identified mineralized zones below the 750 m elevation are open at depth and some along strike. In view of the fact that there are a number of ore shoots, the combined resource per vertical metre over the full strike of the mineralized zone allows for an increase in production rate in the event of significant further reserves being defined.

AG considers that there is an opportunity to discover new ore bodies as well as to explore the full extent of the existing ore bodies, and recommends a re-interpretation of the structure of the mine to assist in the identification of exploration targets.

In addition to this on-mine exploration and the work that is being done on surrounding targets, there are a number of other targets within a 5 km radius of the mine that warrant detailed exploration.

As far as mining is concerned, AG considers that there is an opportunity to reduce dilution through improved techniques and better controls on the economic versus structural outlines of the ore bodies, but a more detailed study of this aspect is recommended before any action is taken.

## **21 INTERPRETATION AND CONCLUSIONS**

Blanket Mine has operated successfully for almost 100 years and produced in excess of 1 million ounces of gold. In particular the mine's recent history has been marked by valiant effort to withstand the rigours of a hyperinflationary economy. Although the mine is regarded as a relatively low grade mine, it has managed to maintain a reasonable operating margin notwithstanding its exposure to long periods of gold price at a significant discount to the spot price of gold. Blanket's success stems largely from

- the quality of its orebodies which enables low cost mining
- the sound working relationship with staff, many of whom have been on the mine in excess of 20 years
- the efficient metallurgical recovery in excess of 90%

Table 19.1 presents the Mineral Resources and Mineral Reserves for the Blanket Mine for the half year ending June 30, 2006.

Table 19.1: Summary of Mineral Resources and Mineral Reserves, Blanket Mine, 30<sup>th</sup> June 2006

MINERAL RESERVES (@Au price US\$500/oz)

Classification	Tonnes	Grade Au g/t	Content (kg)	Content (oz)
<b>PROVEN ORE</b>				
Operating Areas	917,200	3.96	3,628	116,640
Pillars (discounted by 50%)	247,600	4.59	1,137	36,560
Blanket Tailings	145,600	1.63	237	7,620
Total Proven Ore including Pillars	1,310,400	3.82	5,002	160,820
<b>PROBABLE ORE</b>				
Operating and Development Areas	2,326,000	4.10	9,540	306,700
<b>Total Proven + Probable Ore</b>	<b>3,636,400</b>	<b>4.00</b>	<b>14,542</b>	<b>467,500</b>

**Note:** For Proven ore, tonnages are rounded to nearest 100 and ounces to nearest 10; for Probable ore, tonnages are rounded to the nearest 1000, ounces to the nearest 100 and kilograms to the nearest 10.

MINERAL RESOURCES (@Au price US\$500/oz)

Classification	Tonnes	Grade Au g/t	Content (kg)	Content (oz)
<b>Indicated</b>	380,000	4.12	1,600	51,000
<b>Inferred</b>	2,400,000	5.91	**	**

**Notes:** Indicated Resource tonnages have been rounded to the nearest 10 000, ounces to the nearest 1000 and kilograms to the nearest 100; Inferred resource tonnages have been rounded to the nearest 100 000:

\*\* - In keeping with the requirements of NI 43-101, Inferred Resources are reported without estimates of metal quantities.

## 22 RECOMMENDATIONS

The established methods of Resource and Reserve estimation have been well tested with time and can be relied upon to present a fair reflection of the actual situation. However AG considers that improvements could be achieved by making frequent SG determinations of the ore and applying different values for different ores instead of a blanket value for the whole mine. A full performance and quality control audit of the assay laboratory is required in the near future to ensure that it is maintaining satisfactory analytical standards.



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## **24 DATE AND SIGNATURE**

This report Independent Qualified Persons Report, Blanket Mine, Zimbabwe has been prepared by Applied Geology Services CC



Signed: David Grant, BSc (*Spec Hons*), MSc (*Min Ex*), Pr. Sci Nat., FGS, CGeol., FSAIMM, FGSSA  
Consulting Geologist

The effective date of this report is 30<sup>th</sup> June, 2006. It was completed, reviewed and revised by 4<sup>th</sup> August, 2006.

## 25 ADDITIONAL REQUIREMENTS FOR TECHNICAL REPORTS ON DEVELOPMENT PROPERTIES AND PRODUCTION PROPERTIES

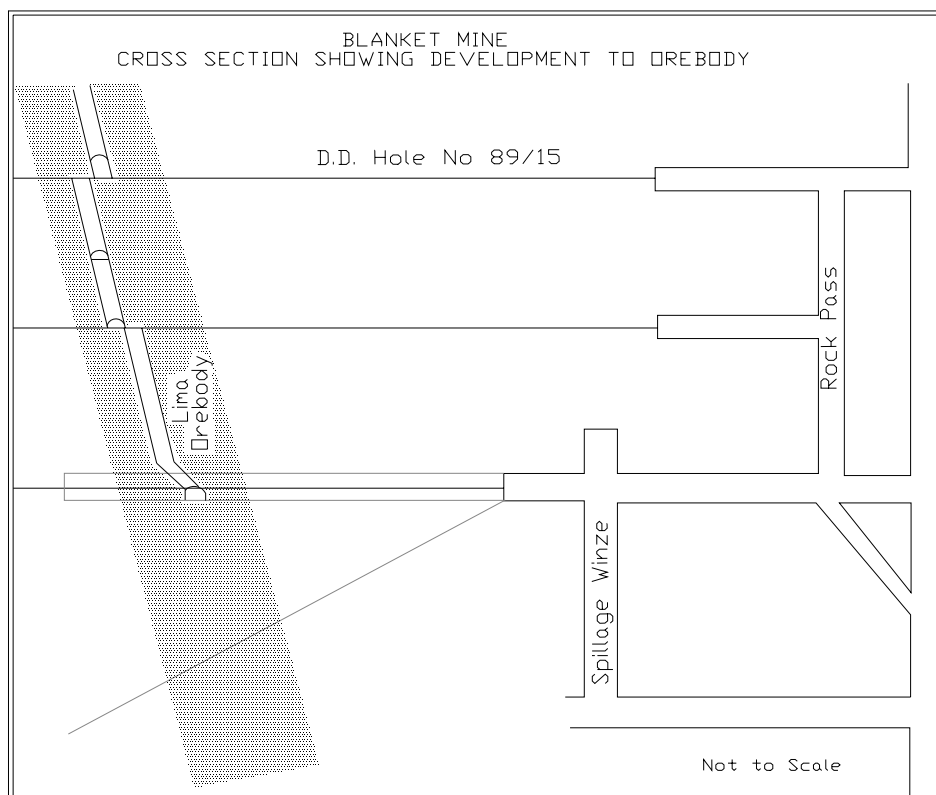
### 25.1 Mining Operations

Production from the Blanket Mine property has taken place for over a hundred years. The mining methods employed at the Blanket Mine represent the experience gained over this period and are described in this section of the report.

#### 25.1.1 Development

At the shaft sinking stage, crosscuts from the shaft to the ore body are cut every 30 m down the shaft. Diamond drill holes are drilled from these crosscuts to locate the ore shoots so as to guide development. Figure 25.1 presents a cross section showing typical development to define an ore body.

Only the main levels between ore bodies are developed in waste, with the remainder of the development being mostly within the mineralised zones. Primary development can also be handled separately as waste.

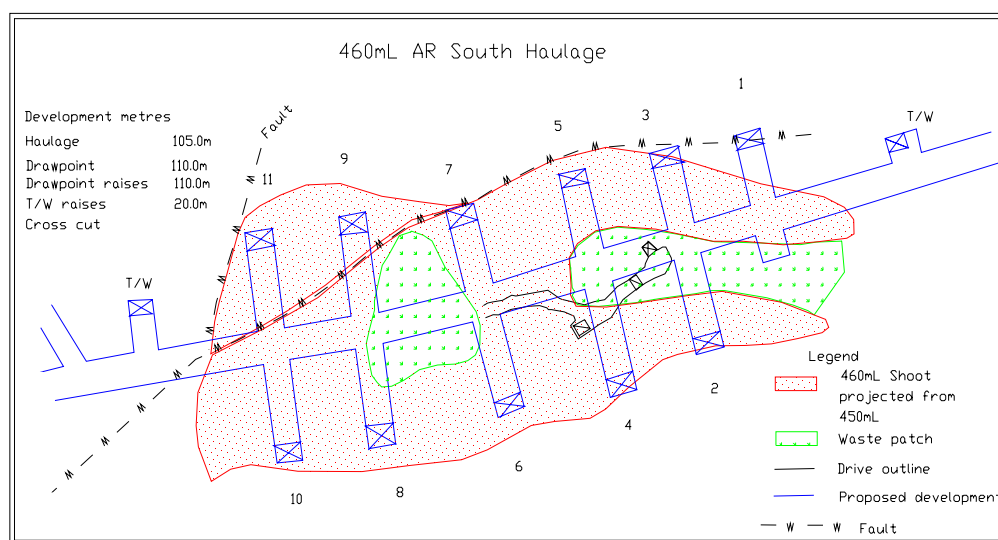


**Figure 25.1** Cross section showing development to an ore body

When the shaft reaches the anticipated bottom, normally two levels (60 m) below the bottommost level, loading chute pockets and spillage arrangements are excavated and equipped. Equipping of the shaft to handle all the development ore via the loading chutes is also undertaken. A crosscut from the shaft, on the bottom main level, is then mined to intersect the ore body. Strike development following mineralisation then ensues. Drives are mined 3.0 m squared and equipped with rails. Mucking is by LM56 rail-bound rock loaders. Subsequent levels above are mined with muck being lashed by hand and wheelbarrow and passed down a common rock pass to the loading chutes.

Stoping preparations in narrow ore bodies (<3.0 m) begin by mining box raises sited at 10 m intervals along the haulage. These are usually mined from the footwall of the ore body to 10 m above the haulage drive. The extreme end raises are equipped as ladder ways while the rest have boxes constructed under them.

In wider ore bodies (>3.0 m), air loader operated draw points are mined instead of boxes. This is because wider ore bodies are mined using longhole open stoping methods that generate bigger rock sizes than using jackhammers. For ore bodies up to 25 m in width, the haulage is centrally located within the ore body with 8 m to 10 m long draw point crosscuts, spaced 10 m apart, mined either side of the haulage. At the end of these crosscuts, draw point raises are pushed 10 m to the above coning level. For ore bodies less than 12 m wide, this haulage is mined on the footwall of the ore body with draw point crosscuts spaced 10 m apart, pushed to the hanging wall contact. Raises are then mined from these draw points to the coning level above. These draw points are mined 3.0 m squared with a LM56/57 loader being used to muck the ore into 80 cubic feet Granby hoppers. Figure 25.2 presents a typical development plan.



**Figure 25.2 Typical Ore Body Development Plan**

Just as in box mining, the extreme end raises are equipped as ladder ways. In both cases a sublevel drive is then mined off the central raise to connect all raises laterally. This signifies the end of the development of the coning level. Three raises, one central and one at each end are then mined from the cone drive to 15 m above, where

the first production level is developed. This procedure is used to develop and connect all subsequent levels above at 15 m vertical intervals.

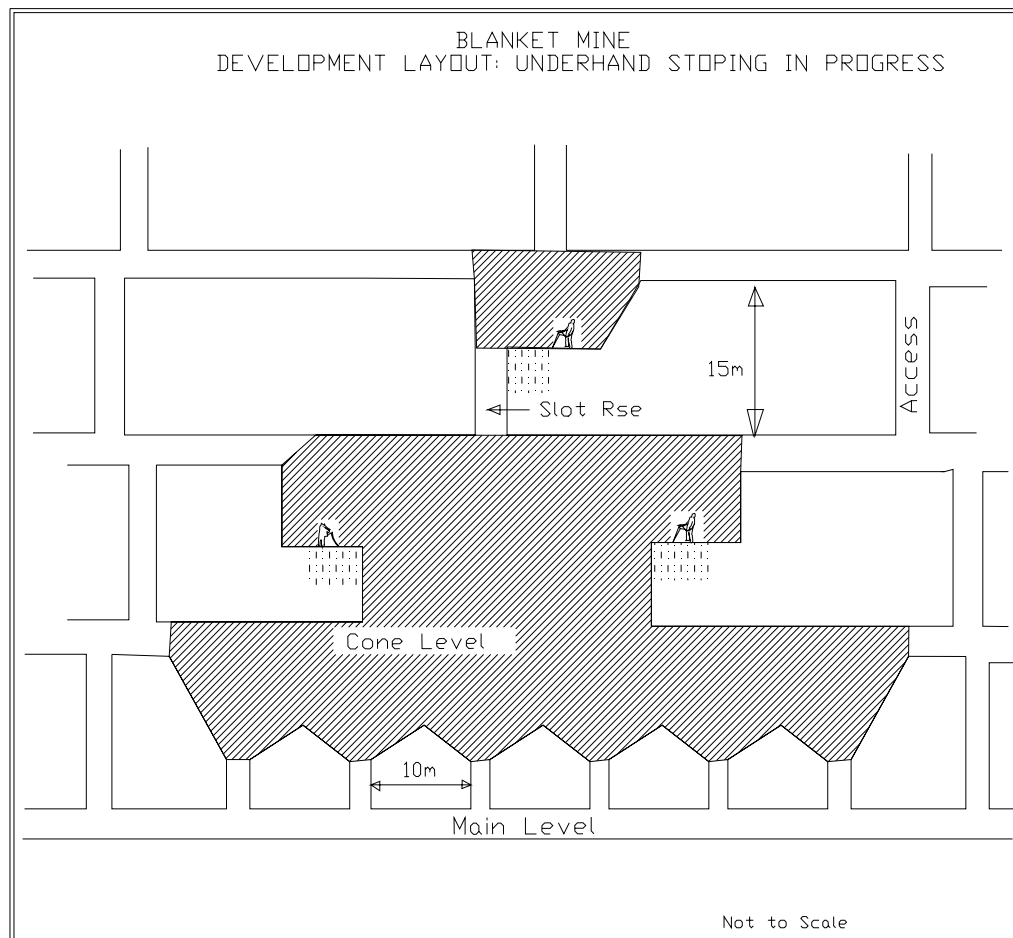
In all development ends the drilling pattern is a six-hole burn cut drilled to a depth of 2.0 m. The round is charged using Anfo explosives initiated by a No. 6 detonator primed by a 28 mm by 280 mm Emulite cartridge. Anfo (94 parts ammonium nitrate, 5 parts diesel and one part coal dust or mealie meal) is delivered into the holes using pneumatic loaders. Timing is by slow igniter cord set off by an electric shur-starter. Sublevel dimensions are 1.8 m high by 1.5 m wide.

### **25.1.2 Underhand Bench Stoping**

The underhand bench stoping is usually applied in the narrow orebodies and allows for control of the stoping width and therefore the dilution.

Figure 25.3 presents a cross section indicating a typical underhand stoping method in use at the Blanket Mine. Stopping commences by slipping around the central raise on the cone level to expose both the hanging wall and footwall assay contacts and will continue in retreat fashion for 5 m either side of this raise. Coning will then commence by blasting into the slot taking the full width of the ore body. The cone progresses down to about 3 m above the main level. Coning starts from the slot retreating in both directions on strike. As soon as the coning retreats a sufficient distance from the slot (such that men are safe from rocks falling through the slot from operations above) a new stope is commenced at the central raise on the next level above. This process will be repeated on the sublevels above until a sufficient number of stope faces are in production above the cones to give the required tonnage.

Holes are drilled at 0.8 m burdens by 0.8 m spacing. The staggered hole pattern is drilled to a 2 m depth. The holes, angled at 70° to 80° towards the open stope, average 34 mm in diameter. Only one bench, about 7 m long, is mined at a time until it holes through to the level below. Holes are charged with Anfo packaged in plastic paper tubes about 0.6 m long by 25 mm diameter, or simply pumped into the blast holes with a compressed air Anfo loader if the holes are not wet. Hole initiation is by 2.1 m capped fuses primed by 28 mm by 280 mm Emulite cartridges. The average stope width is about 2 m and the expected output per machine shift is 40 tonnes.

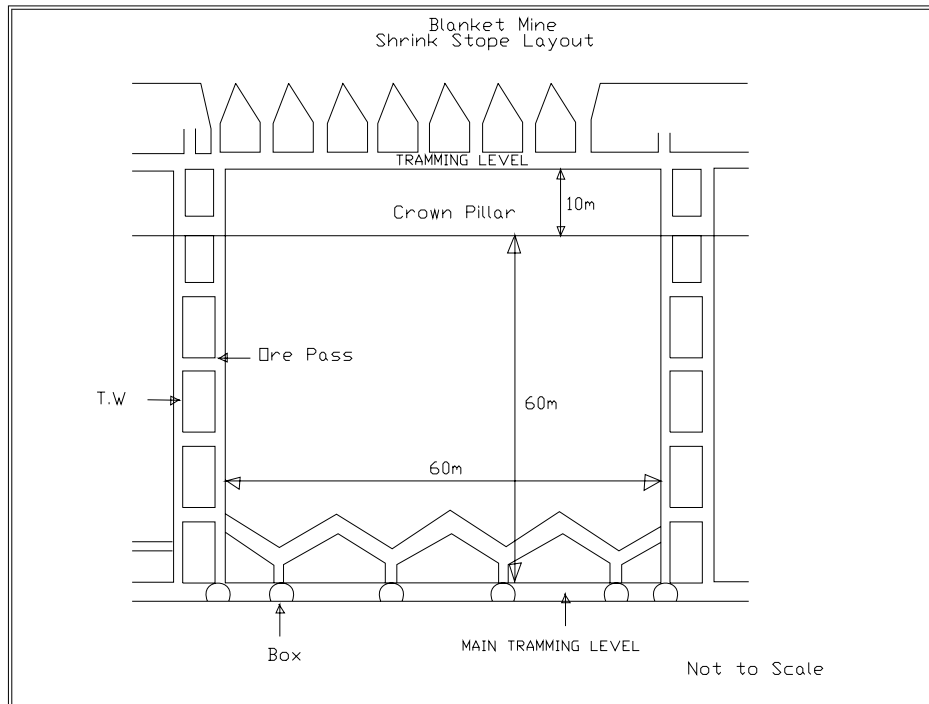


**Figure 25.3 Vertical Sections Indicating Typical Underhand Stopping Method**

### 25.1.3 Shrinkage Stopping

Shrinkage stopping is done in the Quartz Reef stopes where blocky sidewalls are evident. The shrinkage pile offers passive support to the sidewalls and prevents slabs of waste rock from diluting ore.

Figure 25.4 presents a cross section indicating a typical shrinkage stopping method in use at the Blanket Mine. In ore zones with unstable sidewalls such as the Blanket Quartz Reef on 22 Level and the Blanket-Feudal above 4 Level, shrinkage stopping is used as it gives passive support to the sidewalls. A stope is typically 60 m long by 60 m high. Box raises are mined initially for 3 m up to make a dogleg before being angled at 50° towards each other in order to link them and thus form cones. Box raise spacing is 10 m. Shrinking commences with up holes being drilled from the box raises. Access to the stope is by means of travelling ways mined parallel to, and connected to the ore passes every 15 m.

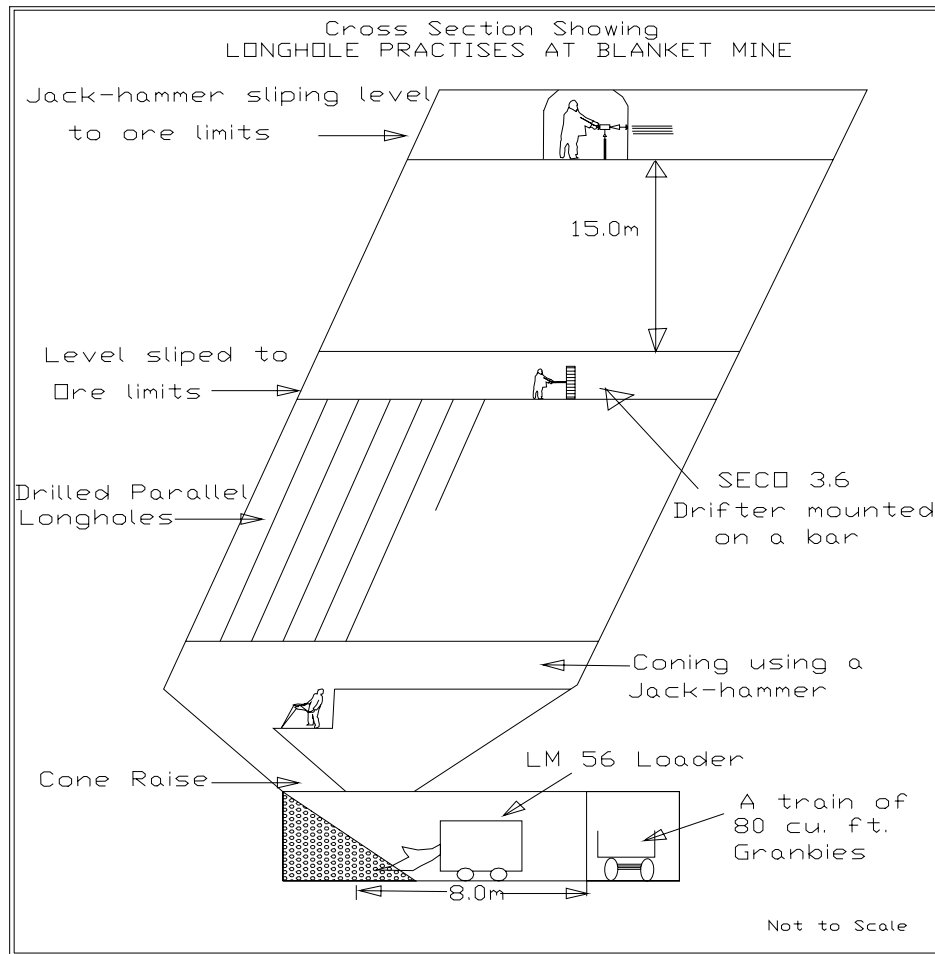


**Figure 25.4 Cross Section Indicating Typical Shrinkage Stopping Method**

### 25.1.4 Longhole Stopping

Longhole stoping is the predominant mining method used at the Blanket Mine. The preparatory development for this mining method is described in Section 25.1.1 of this report. Figure 25.5 presents a cross section indicating a typical longhole stoping method in use at Blanket Mine.

Longhole stoping is applied to the wider orebodies and the development is done within the confines of the assayed hanging wall and footwall. The sub-levels are spaced 15 m apart vertically and although sampling is done on the sub-levels, the variation in the orebody between sub-levels will allow waste or low grade ore to be included in the rings when these are blasted.



**Figure 25.5 Cross Section Indicating Typical Longhole Stopping Method**

On the coning level the ore body is slashed out to assay limits from the hanging wall to the footwall. CH123 and Konkolas (Seco36) are used to drill long holes to a diameter of 51 mm to 57 mm. The metres drilled per shift vary from 25 m to 40 m on a drilling pattern with a maximum burden of 1.3 m by 1.5 m spacing. Charging is by 12 m long Nonel Handidets primed by 45 mm by 560 mm ammonium-based Emulite cartridges. Anflex is pneumatically pumped to half way up the hole, and a booster cartridge of 45 mm by 560 mm Emulite is placed into the hole before Anflex pumping resumes. Nonel Handidets have a bottom delay period of 500 milliseconds and a top delay of 25 milliseconds. A chevron-timing pattern is used when two to three rings are blasted at the same time.

### 25.1.5 Rock Conditions and Rock Mechanics

The different rock types in the Blanket Mine are generally very competent and support such as rock bolts are only installed on rare occasions where weak rock conditions are encountered. In one instance a failure of a slab of rock was experienced in a longhole stope where two joints intersected and allowed a wedge to be formed. This is a rare occurrence and is not considered a high risk. The rock quality at Blanket Mine is largely the result of the high metamorphic grade which has given rise to re-crystallised competent amphibolites as the main wall rock to the ore shoots.



In ore zones with unstable sidewalls such as the Blanket Quartz Reef on 22 Level and the Blanket-Feudal above 4 Level, shrinkage stoping is used as it gives passive support to the sidewalls. The number of stopes mined in the Quartz Reef does not contribute a high tonnage and is not significant to the overall amount of dilution incurred.

### **25.1.6 Ore Handling**

The main active tramming levels are 7, 14 and 22 Levels. 22 Level is 750 m below surface. A total of 11 hoists are installed and operational at the Blanket Mine. Three are ore handling hoists, namely Main Incline Shaft, Sub-vertical Shaft, and 6 Winze Shaft.

Ore is hoisted from 22 Level up 6 Winze Shaft (equipped with rope guides) to 14 Level, 510 m below surface, where it is trammed by a 6 tonne loco pulling ten 80 ft<sup>3</sup> Granby cars to the Sub-vertical Shaft grizzlies some 400 m away. The Sub-vertical Shaft hoists ore from 14 Level to 7 Level where there is an automatic transfer to the Main Incline Shaft, which hoists the ore to surface. The Main Incline Shaft is a compound shaft with the first leg at 45° and the second at 68°, both angled to the west.

The Main Incline Shaft is a 90 kW double drum Prof hoist with a skip capacity of 1.8t. The Sub-vertical Shaft is a three compartment shaft equipped with three 100 mm by 100 mm angle iron guides, a 45 lb rail guide, and a ladder way. It has the same hoist and skip capacity as the Main Incline Shaft. The 6 Winze Shaft has a single drum 90 kW hoist with a capacity of 1.8 t.

The 6 Winze Shaft can hoist up to 180 tpd, while the Sub-vertical Shaft can hoist up to 600 tpd, and the Main Incline Shaft can hoist up to 800 tpd. The constraint to produce more than 600 tpd lies with the Sub-vertical Shaft. The Main Incline Shaft is in the process of being deepened and re-equipped so that the Sub-vertical Shaft is no longer a bottleneck, and triple-handling of ore is eliminated. This will facilitate an overall increase in the production rate to 1,000 tpd.

### **25.1.7 Services**

The Blanket Mine's underground drilling and slashing is done mainly by compressed air operated equipment (jackhammers, drifters and loaders). A total compressed air capacity of 9,850 cfm is in place. 5,900 cfm is installed at Blanket, with 3,950 cfm at Lima. An 8 inch pipe line feeds underground from Blanket (with a 4 inch line feeding the plant), while a 6 inch pipeline feeds from Lima. The current mine's compressed air requirements exceed the installed capacity by about 2,000 cfm, and there is need for an additional compressor. Until sufficient foreign exchange can be made available to secure another compressor, more efficient use of air will have to be practised.

The Blanket Mine is generally a dry mine, with 40 m<sup>3</sup> to 60 m<sup>3</sup> of water pumped per hour to surface at any one time from the 7 Level pumping station. The station is currently being upgraded to a capacity of 150 m<sup>3</sup> to handle extreme rainy conditions. Pumping is done in stages on five levels, 7, 9, 14, 19 and 22 Levels.

Ventilation at the Blanket Mine is largely natural with the Main Incline Shaft, Jethro Surface Shaft, 5 Winze Shaft, and Sub-vertical Shaft down-casting, and other shafts such as Lima, Sheet and Jethro Winze up-casting. One booster fan has been installed, and 7 fans are installed at development ends. Once mining operations move to below the 750 m Level, a proper ventilation system with forced up- and down-cast ventilation will have to be put in place.

The Zimbabwe Electricity Supply Authority (ZESA) supplies power to the Blanket Mine from its main substation in Gwanda via 33 kV and 11 kV overhead lines. The 33 kV supply feeds Lima, Reclamation, Vubachikwe dump plant and the main substation at Blanket. The 11 kV feeds Jethro Shaft, the slimes dam, Smiler Shaft, the Blanket dam pumps and the village. The 11 kV line is further transformed to a 550 V supply at Jethro and Smiler, and 380 V supply at the slimes dam.

All underground equipment operates on 550 V.

## **25.2 Recoverability**

A hundred years of gold mining at Blanket Mine have provided ample opportunity to investigate the metallurgy of the Blanket ores. Old sand dumps at Blanket Mine are found to have gold grades of approximately 1.4 g/t compared to tails grades of approximately 0.4 g/t currently. Notwithstanding the likelihood that mined grades were generally higher during the early stages of the mine's life, the decline in tails values shows that metallurgical recoveries of these ores have improved.

Currently recoveries of between 88% and 92% are being achieved which is good by Archaean gold standards. While there is still an opportunity to improve the recovery of gold locked in sulphide grains, metallurgical recoverability does not represent an area of underperformance at Blanket Mine.

## **25.3 Markets**

This section of the report addresses gold sales and foreign currency accounts under the current Zimbabwe government.

### **25.3.1 Situation at the Blanket Mine under Current Economic and Political Conditions**

The Zimbabwean economy has continued to deteriorate for the past 7 years, with virtually all economic sectors experiencing viability difficulties. The major factors impacting Zimbabwe's economic position are:

- Foreign currency shortages arising out of extremely poor export capability
- Political instability
- Hyperinflation reaching 1180 percent

- Serious food shortages resulting from the drought coupled with the policy of compulsory land acquisition without compulsory utilisation.

The above conditions have adversely impacted the Blanket Mine in numerous ways but notwithstanding these difficulties, the mine has weathered the situation remarkably well. The immediate impact on the mine is the low gold revenues received via a two tier gold pricing system which has seen the government absorb much of the benefit of the improved international gold price. While this has effectively denied the mine the opportunity to grow its profit margin, the price received was structured in such a way as to keep the mining industry going. The main victim of this situation is labour force which receives very low wages by international standards. In addition, the mine's capital programme has been delayed considerably on account of the limited access to foreign currency with which to buy the critical materials and equipment for capital expansion.

However, the changes with regard to the gold price received and the foreign currency accounts announced on the 31<sup>st</sup> July 2006 will have a significant positive impact on these issues and allow the mines to provide capital for expansion programs.

### **25.3.2 Foreign Exchange Shortages**

Foreign currency shortages remain the key factors driving the economic decline in Zimbabwe. Government has numerous short term strategies in place aimed at taking control of the foreign earnings component of export industries, mainly agriculture and mining. These have placed a stranglehold on critical aspects of the economy and have forced numerous gold mines to shut down during this decade. Official gold production in Zimbabwe has declined to 14,023 kg during 2005 from 21,330 kg previously, and is set to fall below 10,000 kg in 2006.

Faced with a situation in which foreign exchange earning capacity is declining rapidly, the government implemented a number of measures aimed at reversing the situation and restoring growth and stability to the mining sector, in particular gold. In a policy announcement on 31<sup>st</sup> July, 2006, the Zimbabwe Reserve Bank released revised measures for gold pricing and foreign currency holding, viz.

- The official exchange rate was dropped to US\$1 : Z\$250,000 (1 : 101,195).
- Mines may now receive 75% (40%) of their gold revenue in hard currency and these amounts may be retained indefinitely in foreign currency accounts (FCA) compared to only 30 days previously. There is still a complication here in that only 50% of the revenue is received immediately with the remainder received after 21 days.
- The gold floor price has been scrapped and therefore mines will now receive the spot price for gold (previously Z\$2,500,000 per gram). 75% of this will actually be at spot in hard currency, but 25% will be at the ruling exchange rate which is approximately 110% overvalued relative to the parallel market.
- The removal of three noughts off the face value of the Z\$ is essentially cosmetic but will allow businesses to manage the currency with more ease and current equipment.

### **25.3.3 Gold Floor Price**

Gold mines in Zimbabwe are legally bound to sell all gold produced to the Government of Zimbabwe according to a two tier price structure set by the Zimbabwean Authorities. The announcement by the governor of the Zimbabwe Reserve Bank on 31<sup>st</sup> July, 2006 effectively abolished the floor price for gold. Previously 60% of each unit of gold produced was purchased at a rate of Z\$2,500,000 per gram while the remaining 40% purchased at the ruling US\$ gold price at the time of the sale.

The official exchange rate set by the Reserve Bank of Zimbabwe between the US Dollar and the Zimbabwe dollar is 1:250,000 (as at 31<sup>st</sup> July 2006) but the more realistic value of the Zimbabwe Dollar is represented by the unofficial (Parallel Market) exchange rate of approximately US\$:Z\$ 1:555,000. So whilst the official exchange rate suggests that the mine receives spot (about US\$640 per ounce of gold) for 100% of its production, the real value of the sale is equivalent to about US\$552 per ounce.

### **25.3.4 Foreign Currency Accounts**

The mine may use the foreign exchange generated by the sale of the 75% (40%) of gold at the ruling gold price for purchases of consumables and capital equipment outside of the country. Furthermore, these amounts may be held as foreign currency indefinitely and not for only 30 days as before. Whilst Blanket Mine has benefited from these arrangements, the foreign exchange situation in the country remains critical and will take some time to correct, even with the recently announced concessions.

### **25.3.5 Political Situation**

The mineral sector in Zimbabwe is a major contributor to the economy but recent political instability within the country has had an adverse effect on many sectors within the economy. There is general disenchantment resulting from economic stagnation and alleged corruption within the Government and there is currently a high rate of unemployment.

Notwithstanding the current economic and political climate, there are a number of positive elements that make investment in Zimbabwe's mining industry attractive. Zimbabwe has a strong mining tradition and its mining laws are clear and generally well administered. Zimbabwe's infrastructure and transport systems are well developed compared to other African countries.

In view of the importance of mining to the country's development, and the continuing need for foreign capital, it is most unlikely that the Government would pass any unfavourable or unfair legislation comparable to the Land Acquisition Act 1992 in respect of foreign held mining interests. This is highlighted by the recent relaxing of the tight monetary restrictions placed on gold mines in Zimbabwe.

In addition to the risks of operating in an emerging market, it is likely that pressure will be applied to improve wages and working conditions, potentially adding to the cost of operations.

### **25.3.6 Conclusion**

Despite the instability in Zimbabwe, the Blanket Mine continues to produce gold in line with planning objectives. The following summarizes the current situation at the mine and in the country:

- The Blanket Mine continues to produce in accordance with its 2004 business plan generating positive cash flows, although costs are higher in Zimbabwe dollar terms than the business plan estimates.
- The abolition of the gold floor price now allows for gold mines to receive real revenues almost in line with the spot gold price, although a portion of the revenue will be delayed for a period of 21 days. The only area of concern here is whether the proportion of gold sales for which the mine receives Z\$ is increased again or not.
- Maintenance of the foreign currency accounts is vital for control of material costs and the increase from 40% to 70% will greatly improve Blanket Mine's outlook.
- The government needs to review the macro-economic fundamentals to address the crippling hyperinflation, which has eroded individual buying power and undermined the viability of business, resulting in the national unemployment rate rising to 70%. A lobby by the major Zimbabwean gold producers is currently addressing this issue.
- Bearing in mind that the Zimbabwean economy has been under pressure for nearly a decade, Blanket Mine has been remarkably resilient in not only surviving the turmoil but meeting production objectives. The recently announced Reserve Bank policy with regard to mining companies and industry in general suggests a slowdown, if not a turnaround, in the economic decline.

Given this scenario, the outlook for Blanket Mine is significantly improved.

## **25.4 Contracts**

The Blanket Mine smelt their gold twice a month and deliver it to the Refinery, which is operated by the Reserve Bank of Zimbabwe. Historically, the mine has been paid three to four days later for 100% of the fine gold delivered; 60% paid at the Support Price, and 20% at the US dollar spot price at the time of delivery but paid in Zimbabwe dollars at the official exchange rate. The remaining 20% of foreign exchange was used to buy imported spares and consumables, with the approval of the Chamber of Mines and the Reserve Bank.

The recently announced changes relating to gold sales and foreign exchange mean that in future the mine will be able to sell 75% of their gold production to the reserve bank at the US\$ spot price and that this revenue may be retained in the FCA account indefinitely for use in importing critical materials and capital items as approved by the Reserve Bank. The remaining 25% will be paid at the spot price but in Z\$.

## **25.5 Environmental Considerations**

In 1995 a full Environmental Impact Assessment was completed by SRK to identify the major detrimental aspects of the mining operation and recommend remedial measures. Apart from the potential to pollute groundwater from the tailings dam, no significant detrimental environmental impacts were identified by this study.

Kinross Gold Corporation, the owners of the mine up until June, 2006, issued an Environmental Policy and Framework document in 2001 based on ISO 14001, which serves as the guideline for all environmental issues at Blanket Mine.

The Government of Zimbabwe has enacted regulations covering water and effluent disposal, although the all-encompassing Environmental and Natural Resources Act has yet to be promulgated. Under the Water Act and the Waste Disposal Regulations a mine is required to obtain permits for all effluent disposal and two permits have been issued to the Blanket Mine by the Zimbabwe National Water Authority covering the sewage effluent and mill tailings disposals.

In February 2002 SRK conducted a Technical Risk Assessment of the Tailings Dam Complex that included all environmental and safety aspects of the tailings deposition and in particular a stability analysis. It was noted that while both the contiguous A and B dams had no major visible problems, the following significant recommendations were made and subsequently implemented by Blanket Mine:

- The penstock of Dam A be inspected by video camera
- More piezometers be installed
- The freeboard of Dam B be increased to acceptable levels
- Elevated underdrains be established on Dam A

On inspection, the Dam A penstock was found to have collapsed, and the dam is currently dormant. The rate of rise on Dam B at 4.25 m per annum was regarded as fairly high, but this will be reduced once a new penstock on Dam A is installed. The rapid rate of rise was restricted to the period when the mine was treating the Vubachikwe sand dumps. These dumps have now been exhausted and at the current treatment rate of 600 tonnes per day, the rate of rise is less than one metre per year. Once the long term production rate of 1000 tonnes per day is achieved in late 2007, the rate of rise is expected to reach two metres per year. The total capacity of the two dams is estimated at 10 more years for a total deposition of 5.4 million tonnes.

Thirty-five new piezometers have been installed and these are being monitored on a monthly basis by the mine and by Fraser Alexander.

In addition there are a number of water boreholes down-slope of the dams that are routinely sampled and the water analyzed for a number of metals, pH, total dissolved solids and conductivity. The analyses indicate that all holes are in the red category as defined by the Waste Disposal Regulations. The reason for this is that the dam was not lined prior to deposition and that seepage has taken place through the floor of the dam. The rate of seepage will decline as the slime level rises. A mitigating factor is the fact that the seepage waters are not acidic. As a result, a number of de-watering holes are planned to lower this pollution to acceptable levels.

Similar monitoring of the sewage disposal area shows that all holes are in the acceptable green category.

In November, 2004, Frazer Alexander Zimbabwe conducted an audit of the tailings dam facility. Besides recommending the implementation of the SANS 0286 Code of Practise that would capture deficiencies prior to an annual audit, the report emphasized the need to repair the freeboard that had been damaged by wind erosion and recommended measures to prevent this happening in future.

### **25.5.1 Closure Plan**

In March 2001 the Blanket Mine contracted Knight Piesold to estimate the costs of decommissioning and closure of the mine. This study included all aspects of the mining operation including open workings, waste dumps and infrastructure. There are a number of Government of Zimbabwe regulations and guidelines including the Mining General Regulations, the Draft Environmental and Natural Resources Act, the Water Act and the Waste Disposal Regulations which cover a mine's closure obligations. These are all addressed and costed in the Knight Piesold report. The cost of closure is estimated by Knight Piesold in 2004 to be US\$1.2 million. The mine is not required to post a bond for this amount, but has reached an agreement with government the break-up value of the plant and mine infrastructure be pledged as a guarantee for the closure cost.

## **25.6 Taxes**

Corporate tax is paid on current profits after allowing for capital expenditure. Current corporate tax rate is 15% with no additional surcharges. All taxes payable to the state are paid in Z\$ and do not impact on the 75% FCA which is used primarily for external sourcing of capital equipment and key materials and consumables.

However, import duties can form a significant component of taxation for industries which rely heavily on imported goods. There is a general surtax of 15% on all imported goods but this amount can vary widely dependent on the items being imported, e.g. a 4x4 vehicle will attract duties of 100 to 110%, while more basic items such as cement are levied at 5%. Fuel is not dutiable.

## 25.7 Capital and Operating Cost Estimates

Table 25.1 presents operating costs at the Blanket Mine for 2006 up to the end of June. The unit costs as defined here have been utilized in the financial model prepared by AG, as described in Section 25.8 of this report; Economic Analysis.

**Table 25.1: Blanket Mine Operating Costs for Year-to-Date June, 2006**

Item	Operating Cost	Unit Cost US\$/t
Total Mining Cost US\$	917,102	
Unit Mining Cost Z\$/tonne		9.23
Total Milling Cost Z\$	834,632	
Total Tonnes Milled	99,361	
Unit Milling Cost US\$/tonne		8.40
Total Services and Admin Z\$	1,488,428	
Unit Services and Admin Cost US\$/tonne		14.98
Total Operating Cost Z\$	3,240,162	
Unit Operating Cost Z\$/oz Au		32.61

Table 25.1 presents budgeted and actual capital expenditures. An estimate of the 2006 capital expenditure, at US\$1.9 million, is based on the capital expenditure as planned in January 2006 and caters for the completion of the equipping of No. 4 Shaft. The amount of US\$1.8 million has been allowed for in the first three years of the LoM Plan and thereafter the capital expenditure has been estimated at 10% of the operating cost per year.

## 25.8 Economic Analysis

Life of mine planning indicates that the daily production from underground increases to 1,000 tonnes per day in mid 2007. Gold production will therefore remain at current levels until such time and then it will increase proportionately with increased throughput.

The No 4 Shaft deepening project is planned in phases between main levels that are 120 m apart. The mine is doing the shaft deepening with its own resources.

Production scheduling prepared by the staff of Blanket Mine was used as the basis for input to the financial model prepared by AG. A summary of the financial model is presented in Table 13.2. The following assumptions were used for the financial model:

- All prices are as at 30<sup>th</sup> June, 2006. In the absence of a floor price for gold, a price of US\$500 per ounce was assumed for revenue purposes and is in line



with the price at which the Reserve and Resource statement was prepared. Although the current gold price exceeds US\$600 per ounce, this model makes provision for the fact that 25% of the gold price received is at a discount of approximately 50% to the parallel market price, while there can be no guarantee that this portion may not increase again in the future. There is no escalation or allowance for inflation. Unit costs are based on the June 2006 Income Statement that includes the revenue and operating costs for June and for the year-to-date from January 2006.

- The current exchange rate (31<sup>st</sup> July, 2006) is Z\$250,000 = US\$1.00 but in view of the high inflation in Zimbabwe, it was considered more practicable to prepare the financial model in US\$. Accordingly the Z\$ exchange rate is used for back conversions only.
- An estimate of the 2006/7 capital expenditure is based on the capital expenditure planned to complete the No 4 Shaft expansion programme as well as that needed for critical replacements. An amount of US\$1.9 million has been allowed for in the first year and thereafter US\$1.8 million for 2 years. After that the capital expenditure allows for ongoing capital at 10% of the operating cost per year. The capital expenditure was considered as a deduction for tax purposes.
- The estimated closure cost of US\$1.2 million is set off against the salvage value of the plant. The rate used for income tax is 30% based on the corporate rate of 15% and a fairly onerous but variable duty on imported goods. The financial model has not taken any extra income, depreciation, interest payable, or levies into account.

**Table 25.2 Blanket Mine Financial Model Generated By SRK**

	<b>Total Production 2006 to 2011</b>
Total Underground Production	3,776,000 t @ 4.05 g/t Au
ROM tonnes per day	920
Mill Recovery	90.0%
Total Recovered - kg Au	13,756
Total Recovered - oz Au	442,300
Revenue at US\$500/oz	221,135,000
Working Costs US\$	124,115,000
Working Costs US\$/tonne (June,2006)	32.61
Services and Admin US\$	16,300,000
Total Operating Costs US\$	140,415,000
Operating Profit/Loss US\$	80,720,000
Capital Expenditures US\$	12,904,000
Earnings Subject to Tax US\$	67,816,000
Taxes @ 30% US\$	17,849,000
Earnings After Tax US\$	49,987,000
NPV @ 15% US\$	21,711,000

## 25.9 Payback

The results of the financial model show that the operation is economically sound at a gold price of US\$500 per ounce. It also shows that the value of operation is particularly sensitive to the increase in production to 1,000 tonnes per day as soon as possible. The net present value (NPV) at a discount rate of 15% amounts to US\$21.7 million based on a sustainable working cost of US\$32.61 per tonne.

## 25.10 Mine Life

Based on the Mineral Reserves and Indicated Resources as at 30<sup>th</sup> June 2006, Blanket Mine has a life of 11 years. Given the fact that Blanket's declared Inferred Mineral Resources have the potential to add significantly to the current mine life, it is essential that the LoM Plan be re-evaluated, and that priority areas be identified for infill drilling and mine planning in an effort to upgrade the classification of the resources and hence the mine life. It is also important to note that the above estimates of

inferred resources are conservative and that there are numerous opportunities to define additions to the existing ore shoots.

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# APPENDIX I

## LIST OF BLANKET MINE CLAIMS

Number	Name	No of claims
5576BM	Harvard	25 Tu
GA547	Blanket J	2 Au
31190	Feudal 3	6 Au
613	Site Slimes	1900
31202	Blanket 9	7 Au
GA281	Sabiwa D B	10 Au
35628	Sheet	10 Au
35629	Sheet1	10 Au
35630	Sheet2	10 Au
35631	Sheet3	10 Au
35632	Sheet4	10 Au
35633	Sheet5	10 Au
35634	Sheet6	10 Au
35635	Sheet7	10 Au
35636	Sheet8	10 Au
35637	Sheet9	10 Au
35638	Sheet10	10 Au
35639	Sheet11	10 Au
36066	Lima 17	2.7Au
36067	Lima 18	9.8 Au
36068	Lima 19	9.7 Au
36069	Lima 20	9.6 Au
36070	Lima 21	9.5 Au
36071	Lima 22	9.1 Au
36072	Lima 23	8.3 Au
36073	Lima 24	10 Au
36074	Lima 25	10 Au
36075	Lima 26	10 Au
36076	Lima 27	10 Au
36077	Lima 28	10 Au
36078	Lima 29	10 Au
36079	Lima 30	10 Au
36080	Lima 31	10 Au
36081	Lima 32	8.68 Au
36082	Lima 33	7 Au
36083	Lima 34	10 Au

<b>Number</b>	<b>Name</b>	<b>No of claims</b>
36084	Lima 35	10 Au
36085	Lima 36	10 Au
36086	Lima 37	10 Au
36087	Lima 38	10 Au
36088	Lima 39	2.04 Au
36089	Lima 40	3.25 Au
36090	Lima 41	3.25 Au
36091	Lima 42	9 Au
36092	Lima 43	10 Au
36093	Lima 44	10 Au
36094	Lima 45	10 Au
36095	Lima 46	10 Au
36096	Lima 47	8.1 Au
36097	Lima 48	3 Au
36098	Lima 49	7.95 Au
36099	Lima 50	5.8 Au
36100	Lima 51	3.4 Au
36101	Lima 52	9.25 Au
36102	Lima 53	8.3 Au
36103	Lima 54	2.18 Au
36104	Lima 55	7.36 Au
36105	Lima 56	6.3 Au
36106	Lima 57	10 Au
36107	Lima 58	10 Au
36108	Lima 59	10 Au
36109	Lima 60	10 Au
36110	Lima 61	10 Au
36111	Lima 62	10 Au
36112	Lima 63	10 Au
36113	Lima 64	10 Au
36114	Lima 65	10 Au
36115	Lima 66	10 Au
36116	Lima 67	10 Au
36117	Lima 68	10 Au
25610	Sabiwa North 1/2	7 Au
36160	Mbudzane Rock A	10 Au
36161	Mbudzane Rock B	10 Au
36162	Mbudzane Rock C	10 Au
36163	Mbudzane Rock D	6.15 Au

<b>Number</b>	<b>Name</b>	<b>No of claims</b>
10050BM	Sabiwa East	20 Cu
10051BM	Feudal 2	25 Tu
GA341	Sheet 2	9 Au
601	Site	5 Ha
1978	Sabiwa South 1/2	6 Au
GA5030	Blanket	7 Au
10894BM	Sabiwa 10	136 As
10895BM	Sabiwa 11	99 As
10896BM	Sabiwa 12	115 As
34052	Lima I	10 Au
34053	Lima J	10 Au
34054	Lima K	10 Au
34055	Lima L	10 Au
34056	Lima M	10 Au
34057	Lima N	10 Au
34058	Lima O	10 Au
34059	Lima P	10 Au
34060	Lima Q	10 Au
34061	Lima R	10 Au
34062	Lima S	10 Au
34063	Lima T	10 Au
34064	Lima U	10 Au
34065	Lima V	10 Au
34066	Lima W	10 Au
34067	Lima X	10 Au
701	Site Housing	10 Ha
573	Site Housing	23 Ha
574	Site Compound	6.25 Ha
575	Site Compound	16.67 Ha
577	Site Cemetery	1.25 Ha
578	Site Magazine	29.17 Ha
GA349	Blanket D	4 Au
3958	Blanket	8 Au
1817	Blanket	13 Au

<b>Number</b>	<b>Name</b>	<b>No of claims</b>
6874BM	Blanket K	25 Tu
GA248	Blanket B	10 Au
35928	OQUEIL	1 Au
35929	OQUEIL 1	2.5 Au
35930	OQUEIL 2	5 Au
35931	OQUEIL 3	7 Au
35932	OQUEIL 4	9 Au
35933	OQUEIL 5	10 Au
35934	OQUEIL 6	10 Au
35935	OQUEIL 7	10 Au
35936	OQUEIL 8	10 Au
35937	OQUEIL 9	10 Au
35938	OQUEIL 10	9 Au
35939	OQUEIL 11	6 Au
35940	OQUEIL 12	10 Au
35941	OQUEIL 13	10 Au
35942	OQUEIL 14	9 Au
35943	OQUEIL 15	3 Au
35944	OQUEIL 16	9 Au
35945	OQUEIL 17	10 Au
35946	OQUEIL 18	10 Au
35947	OQUEIL 19	2.5 Au
35948	OQUEIL 20	10 Au
35949	OQUEIL 21	10 Au
35950	OQUEIL 22	8 Au
35951	OQUEIL 23	3 Au
35952	OQUEIL 24	8 Au
35953	OQUEIL 25	10 Au
35954	OQUEIL 26	7 Au
35955	OQUEIL 27	4 Au
35956	OQUEIL 28	10 Au
35957	OQUEIL 29	8 Au
35958	OQUEIL 30	7 Au
35959	OQUEIL 31	10 Au
35960	OQUEIL 32	7 Au
35961	OQUEIL 33	6 Au
35962	OQUEIL 34	8 Au
35963	OQUEIL 35	4 Au
19923	Jethro	9 Au

<b>Number</b>	<b>Name</b>	<b>No of claims</b>
GA247	Blanket A	9 Au
35753	Lima 1	8 Au
35754	Lima 2	8 Au
35755	Lima 3	10 Au
35756	Lima 4	10 Au
35757	Lima 5	10 Au
35758	Lima 6	10 Au
35759	Lima 7	10 Au
35760	Lima 8	6 Au
35761	Lima 9	10 Au
35762	Lima 10	8 Au
35763	Lima 11	8 Au
35764	Lima 12	8 Au
35765	Lima 13	8 Au
35766	Lima 14	8 Au
35767	Lima 15	8 Au
35768	Lima 16	5 Au
34744	Sheet A	7.5375 Au
34751	Sheet B	0.33Au
34747	Sheet	9.2 Au
34748	Sheet North A	9.2 Au
34749	Sheet North B	9.2 Au
34750	Sheet North C	2.99 Au
34856	Sheet North D	2.45 Au
GA446	Feudal South	4 Au
GA512	Blanket F	6 Au
21065	Feudal D B E	8 Au
9627BM	Blanket L	23 Cu
9628BM	Sabiwa 3	15 Cu
9629BM	Sheet 3	14Cu
21775	D T	10 Au
GA513	Sabiwa 2	5 Au
645	Site Housing	8 Ha
10358BM	Feudal West	25 As
646	Site Pump	18 Ha
10922BM	Sabiwa 13	68 As
10923BM	Sabiwa 14	93 As
10925BM	Lima H	93 As
10049BM	Sabiwa 4	20 Cu



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4<sup>th</sup> August 2006

## **Certificate and Consent**

I, David E. C. S. Grant, residing at 58, Oak Avenue, River Club, Johannesburg, South Africa do hereby certify that:

1. I am a Consulting Geologist and Member of Applied Geology Services CC with offices at 5 Coombe Place, Rivonia, Johannesburg;
2. I am a graduate of the University of Rhodesia with a BSc (Spec. Hons) in Geology and of Rhodes University, South Africa with a MSc in Mineral Exploration and have practised my profession continuously since 1977;
3. I am a registered Professional Natural Scientist with the South African Council for Natural Scientific Professions, a Fellow of The Geological Society, London, a Chartered Geologist verified by The Geological Society, a Fellow of the South African Institute of Mining and Metallurgy, and a Fellow of the Geological Society of South Africa;
4. I, as the qualified person, am independent of Caledonia Mining Corporation and Blanket Mine as defined in Section 1.5 of the National Instrument 43-101;
5. I have been retained by Caledonia Mining Corporation to prepare the Independent Qualified Person's Report dated July 2006 on a single fee basis and the payment of this fee is not contingent upon the results expressed in this report;
6. I have not received, nor do I expect to receive, any interest in the Blanket Mine or Caledonia Mining Corporation;
7. I visited Blanket Mine from 25<sup>th</sup> to 27<sup>th</sup> July 2006;
8. I am not aware of any material fact or material change with respect to the subject matter of the technical report that is not reflected in the report, which by its omission could make the technical report misleading;
9. I have not had any prior involvement with Blanket Mine;
10. I have read National Instrument 43-101 and Form 43-101F1 and that the technical report has been prepared in compliance with this Instrument and Form 43-101F1;
11. I hereby consent to the filing and written disclosure of the above mentioned report.

David Grant

BSc (Spec Hons), MSc (Min. Ex.), Pr. Sci. Nat., FGS, CGeol., FSAIMM, FGSSA