GOLDEN STAR
RESOURCES LTD.

TECHNICAL REPORT
FIRST TIME DISCLOSURE OF MINERAL RESERVES
HWINI-BUTRE AND BENSO PROPERTIES
SOUTHWEST GHANA

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Prepared for

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Table of Contents

List of Figures

List of Tables

Glossary of Terms

Term	Meaning or Definition
$	United States Dollars (USD)
$/oz	USD per Troy Ounce
$/t/km	Dollar per Tonne (dry) per Kilometer
$M	Millions of United States Dollars
ABA	Acid Base Accounting
AEL	African Explosives Limited
AP	Acid generating Potential
ARD	Acid Rock Drainage
ASL	Above mean Sea Level
Au	Periodic symbol for the element "Gold"
BCM	Bank Cubic Meters
BOPP	Benso Oil Palm Plantation
CAT	Caterpillar
CIL	Carbon-In-Leach
DD	Diamond Drill
DFS	Detailed Feasibility Study
EBIT	Earnings Before Interest, and Tax
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
G&A	General and Administration
g/t	Grams per Tonne
Ga	Giga Annum (one billion years)
GNG	Ghana National Grid
GSR	Golden Star Resources Ltd
GSWL	Golden Star (Wassa) Limited

ha	Hectare
HARD	Half Absolute Relative Deviation
HBB	Hwini-Butre & Benso
IRR	Internal Rate of Return
kg/m^3	Kilograms per Cubic Meter
km^2	Square Kilometers
koz	Thousand Troy Ounces
kt	Thousand Tonne
ktpm	Thousand Tonne per Month
m^3/s	Cubic Meters per Second
Ma	Mega Annum (one million years)
MPa	Mega Pascal
Mt	Million Tonne (dry)
Mtpa	Million (dry) Tonnes per Annum
NP	Neutralizing Potential
NPR	Neutralization Potential Ratio
NPV	Net Present Value
oz	Troy Ounces (1oz = 31.1035 grams)
pH	Potential of Hydrogen (measure of acidity and alkalinity)
PN16	Nominal Pressure rating to 16 Bar (g) @ 120ºC
ppb	Parts per Billion
QAQC	Quality Assurance Quality Control
RAB	Rotary Air Blast (drilling)
RC	Reverse Circulation (drilling)
RL	Relative Level (Elevation)
ROM	Run Of Mine
RQD	Rock Quality Designation
SJR	St Jude Resources Limited
t/m^3	Tonnes per Cubic Meter

tpd	Tonnes per Day
tph	Tonnes per Hour
TSF	Tailings Storage Facility
UCS	Unconfined Compressive Strength
UTM	Universal Transverse Mercator
VRA	Volta River Authority
WGM	Watts, Griffis and McOuat

1.0 SUMMARY

The Hwini-Butre and Benso concessions are located in the Western Region of Ghana. The Benso concessions are immediately to the north northwest of the twin cities, Takoradi-Sekondi and approximately 40km by line of sight south southwest of the Wassa operation at Akyempim. The southern cluster of deposits known as Hwini-Butre are just east of the town of Mpohor, which is about 20km northwest by sealed road from the central market square in Takoradi. From Wassa the straight line distance is in the order of 60km.

The main deposits of interest occur on two prospecting concessions. The southern concession (of approximately 40km^2), known as the Hwini-Butre concession (also sometimes referred to as Mpohor or Dabokrom), is a long, north-south oriented lease area and immediately to the north is the Benso concession (of approximately 43km^2), which consists of three separate concessions (Amantin, Subriso, Chichiwilli).

GSR acquired the HBB properties through the acquisition of St Jude Resources Ltd ("SJR") in late 2005. GSR has a 90% beneficial interest in the HBB properties with the Government of Ghana having a 10% beneficial interest.

The HBB properties lie within the southern portion of the Ashanti Greenstone Belt. The eastern margin of this belt comprises interbedded volcaniclastics while the western margin features a band of highly metamorphosed volcanics. Deposition of the Tarkwaian sediments was followed by a period of dilation and the intrusion of mafic dykes and sill. Subsequent compression and re-activation of faults led to the intense folding and thrust faulting with associated shears and this was accompanied by a regional metamorphic event. The area hosts a range of intrusive lithologies and morphologies including the porphyritic Dixcove granite complexes in the Takoradi area. The age of the various intrusives ranges from 2.2Ga to 2.15Ga.

The southern area of the Ashanti belt is host to numerous gold occurrences which are believed to be related to late stages in the regional metamorphism and the commencement of the structural re-activation events. The majority of gold deposits occur as narrow discontinuous quartz veins generally, but not exclusively, hosted by metavolcanic sequences.

Outcrops are limited but where they do appear it is clear that a number of the major lithological boundaries are faulted with evidence of cataclasis and intense shearing along contacts. The dominant structural grain is oriented northeast with local fracture systems frequently displaying a north-south strike associated with minor splays off the main trend.

The Hwini-Butre property has had a small scale gold mining history dating back to the 1800's, concerted exploration efforts were not put into the property until SJR acquired the property in 1995. SJR drilled 267 RC holes with diamond tails. Since GSR acquired SJR a further 424 holes have been drilled, composed of a combination of RC, DD and RAB.

The Benso concession had a similar history to that of Hwini-Butre however, concerted exploration drilling never occurred until 2001. In total 1,123 holes have been drilled at Benso; primarily RAB and RC holes with diamond tails.

To date there has not been any development of the sites, only small scale mining and some exploratory shafts have been sunk over the last 100 years or so.

In May 2007, GSR completed a Detailed Feasibility Study ("DFS") on the HBB properties that converted a portion of the Mineral Resources to Mineral Reserves and will commence development of the property for full production by Q3 2008.

The mine plan for the Benso and Hwini-Butre operations proposes that the ore will be processed at the existing GSR Wassa CIL processing facility at Akyempim. The production rate is assumed to be 1.2Mtpa and will require that the ore be hauled to Wassa via a purpose built haulroad which will have a maximum distance of 82km.

The Mineral Resources at a $560/oz gold price are shown in Table 1-1.

Table 1-1: Total HBB Mineral Resources (excluding Mineral Reserves), April 2007

Category	Tonnes (millions)	Grade (Au g/t)
Indicated		
Hwini-Butre	0.32	4.28
Benso	0.41	2.47
Total Indicated	**0.73**	**3.23**
Inferred		
Hwini-Butre	0.29	4.39
Benso	0.61	3.41
Total Inferred	**0.89**	**3.73**

The Mineral Reserves at a $480/oz gold price are shown in Table 1-2.

Table 1-2: HBB - $480/oz Mineral Reserves – Summary, April 27, 2007

Location	Reserve Category	Tonnes (millions)	Grade (Au g/t)	Contained Ounces (thousands)
Hwini-Butre	Probable	1.83	5.52	324
Benso	Probable	2.30	3.41	252
TOTAL	**Probable**	**4.13**	**4.35**	**577**

2.0 INTRODUCTION AND TERMS OF REFERENCE

2.1 INTRODUCTION

Golden Star Resources Limited ("GSR") is an international gold mining and exploration Company, focused primarily on mining, mine development and exploration in Ghana, West Africa. In addition the Company has gold exploration interests elsewhere in West Africa and in the Guiana Shield of South America. In Ghana, GSR holds a 90% equity interest in the Bogoso/Prestea and Wassa open pit gold mines. Each of these mines has their own processing facilities and are located approximately 40km from each other.

In late 2005, the HBB properties in southwest Ghana were acquired by GSR through the acquisition of St. Jude Resources ("SJR") a Canadian based exploration Company. At the time SJR had numerous prospecting leases in the Western Region of Ghana of which two currently have the highest potential of being converted to mining leases, namely the Hwini-Butre and Benso concessions, as well as a number of exploration properties elsewhere in Ghana, Burkina Faso and Niger.

SJR had proposed to develop the properties through establishment of open pit mining and standalone processing facilities at Hwini-Butre. GSR, with the aid of independent consultants and contractors, has conducted further exploration, Mineral Resource validation and engineering evaluations on the properties. Several options were evaluated for the HBB property development and for the method of mining.

Once a Mineral Resource was identified at HBB further optimization and project evaluation work was carried out to determine how best to exploit the Mineral Resource. Numerous options were identified with the most profitable being the owner mining and contractor transport of the HBB Mineral Reserve to GSR's Wassa mine for processing through the existing Wassa CIL plant. GSR completed a Detailed Feasibility Study ("DFS") in May 2007 qualifying why this is the best option and discusses the other options that were evaluated in the process.

2.2 PURPOSE OF REPORT

This Technical Report presents details of the location, condition, geology, Mineral Resources and Mineral Reserves of the Hwini-Butre and Benso properties, and has been prepared in support of the public disclosure (May 09, 2007) of Mineral Reserve and Mineral Resource estimates in conformance with Canada's National Instrument 43-101 ("NI 43-101").

This Technical Report is prepared for GSR for submission to Canadian Provincial Securities agencies and the United States Securities Exchange Commission ("SEC").

2.3 BASIS OF REPORT

This Technical Report has been based on verified historical data as well as data collected during recent field programs by GSR or its third party consultants. The Technical Report relies extensively on data collected for, and findings resulting from, the DFS completed by GSR in May 2007.

Within this Technical Report, Mineral Resources and Mineral Reserves have been estimated using the definitions and guidelines of the Canadian Institute of Mining, Metallurgy and

Petroleum (CIM Definition Standards on Mineral Resources and Reserves, December 2005) and as required in NI 43-101.

All units of measure (distance, area, volume, mass, etc) reported herein are in the metric system, unless otherwise stated. Gold grades are in grams per tonne and contained and recovered gold is reported in troy ounces. Units of density are in tonnes per cubic meter. All monetary units reported herein are US dollars unless otherwise specified.

2.4 SCOPE OF PERSONAL INSPECTIONS

SJR had carried out extensive exploration on both properties over a five year period, including trenching, pitting, and diamond drilling. GSR have carried out a due diligence of the results from this work and in 2006 initiated a follow up program of drilling and sampling in order to infill the areas where the SJR drilling was sparse and to extend the known Mineral Resource both along strike and down dip. The drilling and sampling program was under the supervision of Mr. Mitch Wasel, GSR Exploration Manager, who visited the property on several occasions in 2005, 2006 and 2007. Mr. Wasel is a Qualified Person as defined in NI 43-101.

SRK Consulting (UK) Ltd (“SRK”) visited the exploration offices of GSR in Takoradi, Ghana for two weeks in July and two weeks in October 2006. This visit allowed SRK to review at first hand the geological modeling procedures and to suggest any necessary adjustments to the models prior to the Mineral Resource evaluation exercise. SRK carried out a preliminary site visit to the Benso and Hwini-Butre properties in November 2005 and at that time reviewed the sampling procedure, core storage and core logging protocols employed by SJR.

The Mineral Resource validation and estimation work forming the basis of this Technical Report was initiated with SRK in July 2006 and completed during October/November 2006.

In April 2006 SRK prepared a geotechnical core drilling program for each deposit to provide information for the development of geotechnical pit slope design criteria for the preparation of feasibility level engineered pit designs. These holes were drilled during the summer of 2006. A site visit was carried out by SRK during the month of November 2006 to inspect the deposit area and the borehole core. SRK developed appropriate slope design parameters, from an analysis of rock mass and structural information, for use in the preparation of detailed engineered pit designs.

The Mineral Resource models were optimized using appropriate cost, metallurgical recovery, pit slope angles, mining loss and dilution parameters as estimated for each deposit, to define an optimum pit shell per deposit. This selected optimized pit shell was then engineered to determine practical mining pit designs, applying appropriate detailed slope designs, access and infrastructure. Mine designs were completed by Mr. Edgar Urbaez (Private Consultant) (“Urbaez”) who visited the properties in January 2007.

John MacIntyre and Associates (“JMA”) was appointed by GSR to complete a comprehensive metallurgical testwork program on samples of HBB ore. All laboratory testwork was conducted by AMMTEC, Australia. JMA provided estimates of process recovery and processing costs. In total ten variability test samples were submitted which were used for both physical testwork and cyanide leach testwork.

Due to the proximity of the Ben and Subri Rivers to the open pits at Benso, SRK were contracted to perform a hydrological and hydrogeological study on the operation. SRK visited the site in November 2006 to gather data and inspect project conditions for the purposes of that study.

SGS Environment Limited, Ghana ("SGS") where contracted by GSR to perform environmental baseline and socioeconomic studies on HBB and visited the properties and proposed haul routes on several occasions in 2006 and 2007.

Numerous other site visits by GSR personnel, including the author, have been conducted to the properties during the course of completing the DFS.

3.0 RELIANCE ON OTHER EXPERTS

This Technical Report was compiled by GSR and is based on the DFS completed by GSR in May 2007. The DFS relied on many experts and third party professionals that have considerable experience in their respective fields. In summary, the following organizations and individuals have provided expert opinion or conducted testwork for the DFS and hence also for the relevant sections of this Technical Report.

- Geotech modeling and slope recommendations: SRK Consulting Limited, UK (“SRK”)
- Laboratory testing of drill core for Geotech analysis: University of Mines and Technology, Tarkwa, Ghana (“UMT”)
- Metallurgical testwork: AMMTEC Ltd, Australia (“AMMTEC”)
- Metallurgical analysis and recommendations: John MacIntyre & Associates Pty Ltd, Australia (“JMA”)
- Hydrological and hydrogeological studies: SRK Consulting Limited, UK (“SRK”)
- Environmental and socio-economic baseline Study on the HBB concessions: SGS Environment Limited, Ghana (“SGS”)
- Environmental and socio-economic baseline Study for the haulage routes: SGS Environment Limited, Ghana (“SGS”)
- Pit optimizations, pit designs and Mineral Reserve estimates assistance: Mr. Edgar Urbaez (Private Consultant) (“Urbaez”)
- Haulroad designs: CBM Surveys Ltd, Ghana (“CBM”)
- Shadow mining contractor bid: BCM International Limited, Ghana (“BCMI”)
- Project history and previous ownership: Mr. Bob Griffis (Private Consultant), Ghana (“Griffis”)
- ABA testwork: GSR and Council for Scientific and Industrial Research (“CSIR”), Ghana

4.0 DISCLAIMER

This Technical Report has been prepared by GSR under the supervision of Peter Bourke, P.Eng., who is a Qualified Person as defined by NI 43-101. The document summarizes the professional opinion of the authors and contributing Qualified Persons and third party professionals. The author of this report has been intimately involved in the Hwini-Butre and Benso DFS, and this report is based largely on the findings of that study. GSR has relied extensively on specialist external consultants, recognized in their field, to oversee and review the significant aspects of the DFS, and use has been made of their technical reports. These reports are referenced in Section 18.0. GSR has inherently relied on the conclusions and recommendations of these external consultants.

This report includes conclusions and estimates that have been based on professional judgment and reasonable care. Said conclusions and estimates are consistent with the level of detail of the studies carried out and based on the information available at the time this report was completed. All conclusions and estimates presented are based on the assumptions and conditions outlined in this report. This report is to be issued and read in its entirety. Written or verbal excerpts from this report may not be used without the express written consent of the authors or officers of GSR.

5.0 PROPERTY DESCRIPTION AND LOCATION

5.1 LOCATION AND ACCESS

The HBB properties are located in the Western Region of Ghana approximately 5º North of the Equator and approximately 1º 53' West. The Benso concessions are immediately to the north northwest of the twin cities, Takoradi-Sekondi and approximately 40km (straight-line) by line of sight south southwest of the Wassa operation. The southern cluster of deposits known as Hwini-Butre are just east of the town of Mpohor, which is about 20km northwest by sealed road from the central market square in Takoradi. From Wassa the straight line distance is in the order of 60km. (Refer Figure 5-1).

Figure 5-1: Location of Wassa, Benso and Hwini-Butre in Ghana

The Benso concessions are located about 30km due north of the Hwini-Butre concessions and they are accessed by gravel road from Mpohor to Benso and also from the unsealed road running parallel to the railway from Sekondi through Manso to Benso. From Benso, there is an unsealed road that is maintained in fair condition that goes directly to Subriso (road distance of about 6.5km). The railway line from Takoradi to Tarkwa passes through the northern part of the Hwini-Butre concession and just to the south of the Benso concessions.

In the general vicinity of the main deposits on each of the concessions, there are numerous unsealed roads that are accessible for much of the year, although some are flooded immediately after heavy rains.

Presently the most direct access to Benso from the Wassa operations is via Tarkwa; approximately 15km south of Tarkwa turn east after crossing the Bonsa River and follow the forest road to the Neung Forest Reserve for approximately 20km, at which point the town of Benso is reached adjacent to the Benso Oil Palm Plantation ("BOPP"). The Hwini-Butre operation can be reached from Benso by driving south from Benso through BOPP until the town of Mpohor is reached 30km later.

5.2 DESCRIPTION OF PROPERTIES

The main deposits of interest occur on two prospecting concessions as shown on Figure 5-2. The southern concession (of approximately 40km^2), known as the Hwini-Butre concession (also sometimes referred to as Mpohor or Dabokrom), is a long, north-south oriented lease area and immediately to the north is the Benso concession (of approximately 43km^2), which consists of three separate concessions (Amantin, Subriso, Chichiwilli) that were originally part of a larger contiguous lease area. (Figure 5-3)

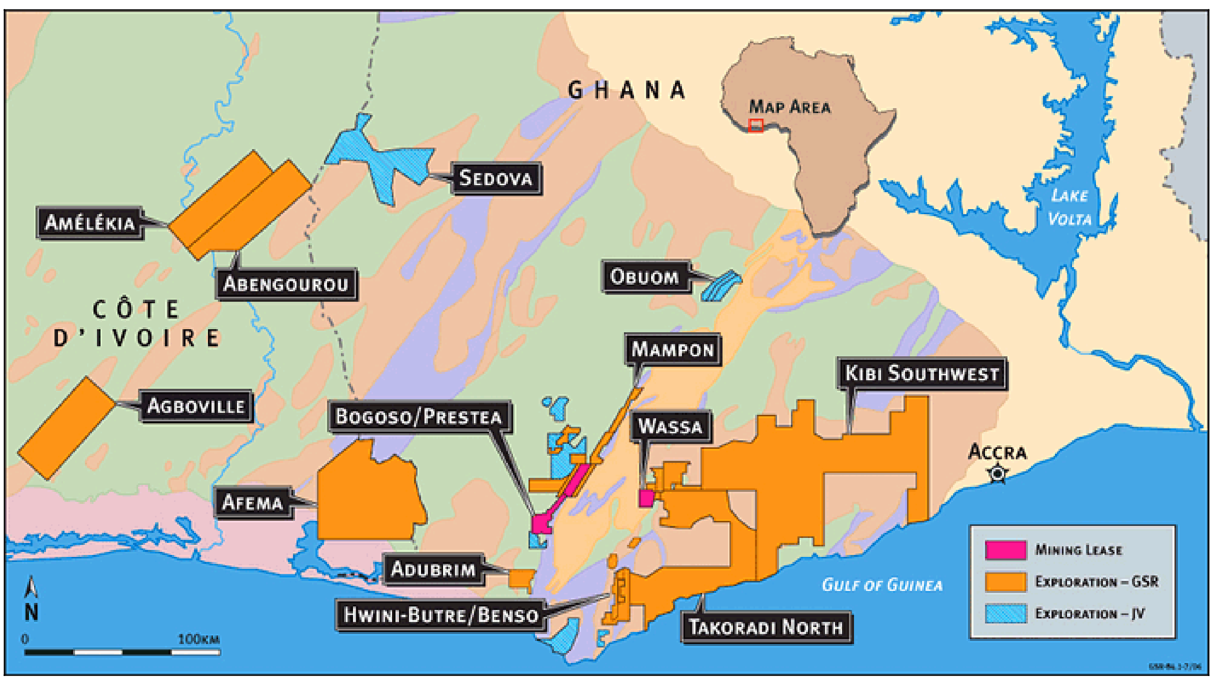


Figure 5-2: General layout of GSR's exploration and mining concessions in Ghana and Cote D'Ivoire

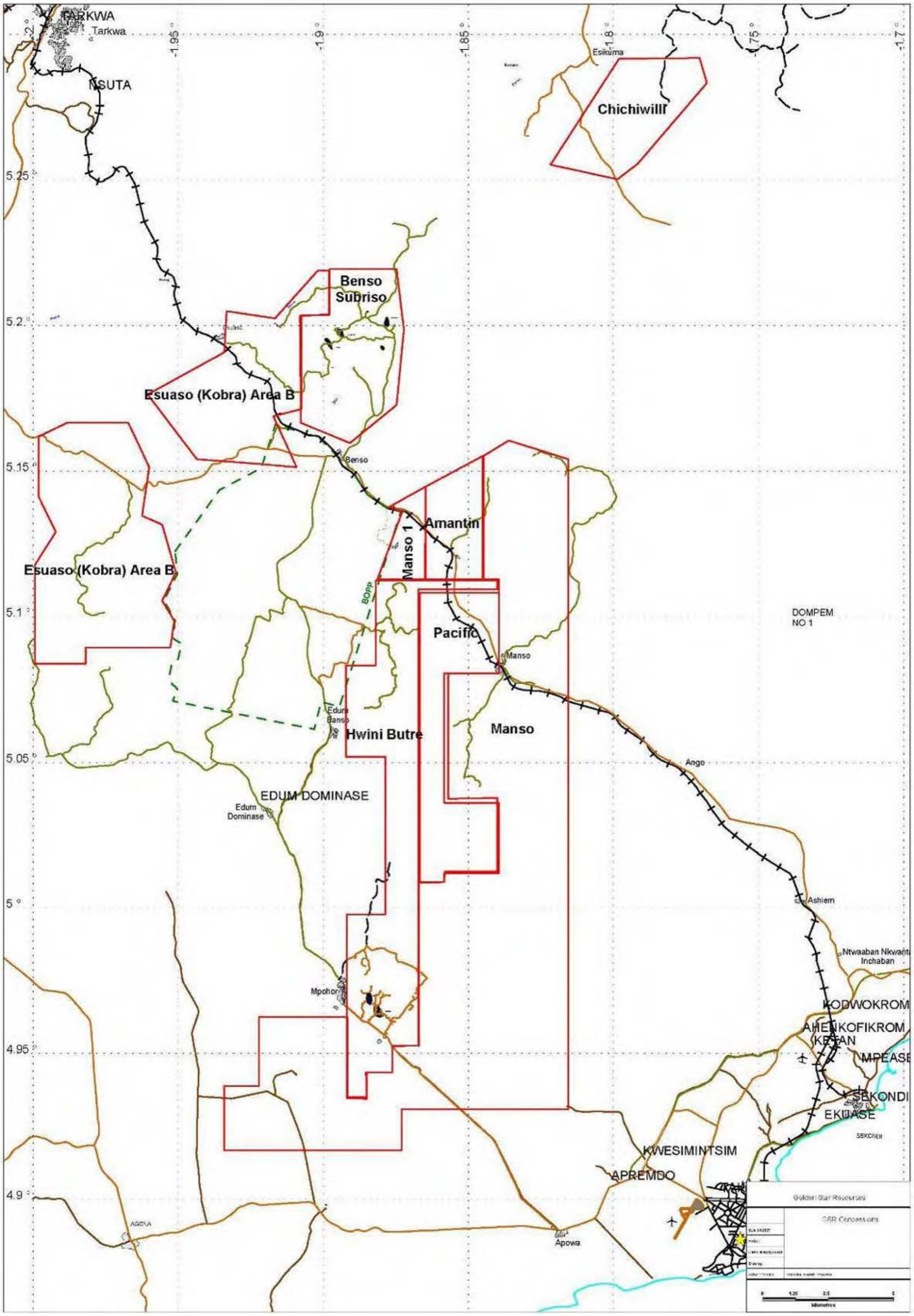


Figure 5-3: GSR's Exploration Concessions

The deposits associated with the HBB project occur in the southern part of the Hwini-Butre concession, which includes Adoikrom, Father Brown and Dabokrom; these are often referred to in this report as the "southern cluster". In the Benso concession, the main deposits include Subriso East, Subriso West, G-Zone and C-Zone; these are also referred to in this report as the "northern cluster" of deposits. (Refer Figure 10-1)

In addition GSR, through SJR has recently acquired a prospecting concession at Manso (of approximately 139km^2) located to the east and south of Benso. In addition, GSR holds an interest in two adjacent prospecting licenses the Pacific Mining concession (of approximately 23.4km^2), which is located close to the town of Manso and the Kobra Mining concession (of approximately 58.7km^2 in two separate blocks) at Esuaso, adjacent to the Subriso block.

All of the above concessions are currently in good standing. The coordinates for each of the GSR concessions in the HBB region are in Table 19-1.

5.3 GHANA MINERAL POLICY

Legislation affecting mining and mineral exploration in Ghana includes the Minerals and Mining Act, 2006 (Act 703) and Regulations, the Additional Profits Tax Law, 1985, the Minerals Commission Law, 1986 and the Minerals (Royalties) Regulations 1986.

Under the Constitution of Ghana and the Minerals and Mining Law, all minerals in their natural state are the property of the Republic of Ghana and are vested in the President on behalf of the People. Title to these minerals is granted under reconnaissance and prospecting licenses and mining leases.

The current mining laws have been designed to stimulate exploration, development, and mine production, and, in general, the legal system is modeled on the English common law system. The Government retains a 10% free carried interest in the rights and obligations of the mineral operations and has the option to acquire a further 20% interest, on agreement of fair value with the holder of the mining lease.

Reconnaissance and prospecting licenses are normally granted for up to twelve months and three years respectively, subject to renewal. Mining leases may be applied for either by a prospecting license holder who has established the existence of minerals in commercial quantities, or by others who do not hold such a license and who establish the same to the satisfaction of the Minister of Mines. Mining leases are normally granted for a period not exceeding 30 years, and the holder may apply to the Ministry for renewal for up to another 30 years. The maximum size of a Mining lease is 6300ha (300ha x 21ha blocks).

The granting of a mining lease by the Minister of Mines is normally subject to parliamentary ratification, unless specifically exempted, and the Ministry has the power to negotiate, grant, revoke, suspend or renew any mineral right. A holder may apply for an enlargement of the mining area, which, subject to Ghanaian mining law, the Minister of Mines may grant if satisfied such approval is in the National interest. A license is required for the export or disposal of any minerals and the Government of Ghana has a pre-emptive right over all such minerals.

The Minerals and Mining Act, 2006 requires that before a mineral right or mining lease can be granted the applicant must have all the necessary approvals and permits required from the

Forestry Commission and the EPA for the protection of natural resources, public health and the environment. Then during the mining operation it is a requirement that the mining Company comply with any and all restrictions and Regulations made under the Act otherwise the mining lease can be revoked. A Mining License is usually granted within 60 days from the date of application.

The environmental approval process includes submitting a Scoping Report followed by an EIS to the EPA. The EPA will generally issue an environmental permit if applicable in 90 days from date of application.

5.4 PERMITTING STATUS

Initial environmental studies for the HBB operations were carried out in 2004-2005 and the final EIS submitted by SJR in late 2005. Upon review of the proposed operations, the EPA issued an Environmental Permit (number EPA/EIA/175) to SJR in February 2006 for the project to be developed.

The EIS submitted to the EPA was based on a 'stand alone' mining project, which included a processing plant in the area to the southeast of Mpohor, where the Hwini-Butre deposits are located. The ores from the Benso deposits, located 30km north of Mpohor, would be hauled by road to the processing plant.

Subsequent to the EPA approval, GSR acquired SJR and with recommendations from the DFS elected not to construct the processing plant at Mpohor. This is a significant change that requires an addendum to be submitted to the original EIS document. As a result of this change in plans, it will be necessary for GSR to submit a revised plan of operations to the EPA in the form of an EIS Addendum. The EPA are fully informed of the changes and the EIS Addendum will be submitted to the EPA in June 2007.

The Mining Lease application was submitted in April 2007 and will be issued pending EPA approval. This process is not expected to be exhaustive and it is forecast that all permits and licenses will be acquired by September 2007.

6.0 ACESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

6.1 TOPOGRAPHY

The area between Mpohor and Subriso falls mainly within the catchment areas of the Butre River to the west and the Hwini River to the east. The topography is quite variable and results from the erosion of extensive peneplain (old weathered) surfaces. Along the coast, two principal peneplain surfaces are clearly preserved in remnants that include an older surface at elevations of 100mASL to 120mASL and a younger one at 50mASL to 70mASL. Inland, these same surfaces increase gradually in elevation and can be identified in lateritic remnants on many of the hill tops.

Around Mpohor, the topography is quite subdued. The broad valley bottoms of the main rivers (Hwini and Butre) are close to 10mASL and gain elevation gradually to the north to about 20m. The low rolling hills in the southern region of this area typically have a very modest relief of 20m to 30m with maximum elevations on a few isolated hills in the range 110 to 120mASL and maximum relief of about 50m to 60m.

Progressing north from Hwini-Butre towards Benso, the hills become more prominent, mostly as a result of more resistant volcanic bedrock. The sharp, narrow valleys bottoms are mainly at elevations in the range 50m to 70mASL whereas the flat, elongate ridges and hills have elevations mostly in the range 160mASL to 170mASL. The most prominent hill is that immediately to the west of Benso, along the west side of the Ben River; this steep-sided hill (relief of 120m to 130m) is capped by thick laterite (at 170mASL to 180mASL), which most likely correlates with the older coastal peneplain. However, most of the hills in the north are at elevations of 100mASL 120mASL, with relief in the range 40m to 60m but some of the valleys have even more subdued topography, especially in the vicinity of the Benso deposits.

6.2 CLIMATE

The area has a moist equatorial climate as it is 5˚ north of the equator. The average rainfall is normally in the range 1,200mm to 1,500mm per year and it falls in two main rainy seasons (Figure 6-1). The longer of these is usually from late March to late June and the second is usually from late September to early November.

The driest and coolest period is quite brief (usually only a few weeks long) and corresponds to the Harmattan ‘season’ when the dry, dusty winds from the Sahara inundate the region. This usually occurs sometime in December, January or February but it remains comparatively dry for at least a month before and after this period. There is also relatively little rain in July, August and extending into September; it is often quite cloudy and cool in this two to three month period.

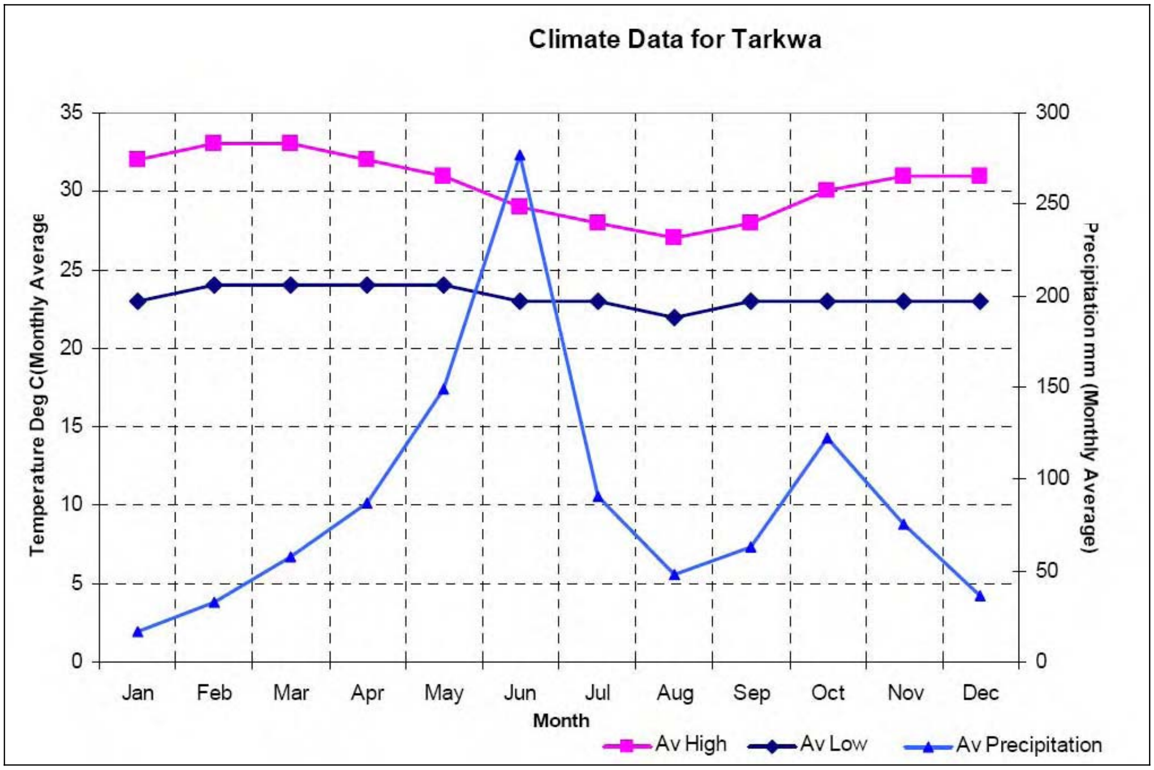


Figure 6-1: Monthly Average Weather Data for Tarkwa

Except for the noticeably dry but short period of the Harmattan, the area usually has high to very high humidity. The daytime temperatures usually peak at about 30-35˚C, with the late October-November and March to early May periods being at the high end of that range. In December and January, some daily highs will not reach 30˚C and night time lows will get into the low 20's but more typically are in the mid 20's. The average daily temperatures are usually in the range 25-28˚C.

In mid year (mid-June to mid September), the area is comparatively temperate and fairly dry as this is when the cold waters of the Benguela Swell make their way up to West Africa and bring cool breezes, especially to the coastal areas of the country.

6.3 INFRASTRUCTURE, PHYSIOGRAPHY AND LOCAL RESOURCES

The concession areas and nearby vicinities have many small towns, villages and an extensive network of infrastructure. The straight-line distance from the central market in Takoradi to the Hwini-Butre deposits are 16km whereas the Benso deposits are about 36km's (straight- line) from the same point.

Takoradi-Sekondi, with a population of about 300-400,000 people, has a major modern port and is the main base terminal for the Ghana Railway Company ("GRC"). It has all the infrastructure of a major city including a large electricity power generating plant at Shama/Aboadze and it will also have a terminal for the offshore pipeline that will transport gas from the Nigerian oil fields. There is a major air force base on the western outskirts of

Takoradi and the air field can be used for commercial purposes upon permission from the air force and aviation authorities.

Within or immediately adjacent to the concessions, there are also a number of major towns and villages. The largest of these is Mpohor (population of about 3,000), which is at the southern end of the Hwini-Butre concession and very close to the southern cluster of deposits (Adoikrom, Father Brown, Dabokrom).

Immediately to the north of Mpohor is the smaller town of Edum Banso followed by the BOPP oil palm plantation community. There are three important towns along the railway at the north end of the Hwini-Butre and south end of the Benso concessions; the largest of these is Manso in the south (population of about 1,000) and to the north is Amantin followed by Benso. These towns are connected to the national power grid but they have limited other infrastructure. (Figure 6-2)

There are many smaller villages (50-200 population) in and around the concession areas such as Subriso in the far north, and Dabokrom on the main road a few kilometers south of Mpohor. In addition, there are many smaller farming hamlets (just a few families each) throughout the area. Most of these have mud and wattle housing but no power and they mainly derive their water from nearby streams, wells or boreholes with hand pumps.

The concessions are traversed by two principal powerline systems. Immediately south of Mpohor and cutting right across (E-W) the Father Brown prospect is a major transmission line that connects the Kojokrom (Sekondi) substation to the Essiama sub-station, just west of Axim. The other powerline system consisting of two parallel transmission lines, goes from the same sub-station along the railway line to the Nsuta-Tarkwa area. These high tension powerlines are suitable for large scale industrial development, such as gold mining operations.

Access to the concession areas is quite reasonable along several all-weather gravel roads and a sealed road from Apowa to Mpohor, which cuts across the southern end of the Hwini-Butre concession. The same road continues north to Edum Banso, through the BOPP plantations and joins the Bonsa-Benso road, close to the railway. Another road from the Kojokrom area by Sekondi follows along the north side of the railway to Manso, Amantin and Benso.

Within the concessions, road access is much more limited. On the Benso concession, there is an unsealed road from Benso to Subriso. The Chichiwilli area is accessed by a good gravel road from Tarkwa-Abosso to Wassa Nkran and the Sekondi-Benso road, adjacent to the railway, cuts across the southern end of the Amanten block. Most of the access within the Hwini-Butre concession is provided by dirt roads constructed by SJR in the course of their exploration work.

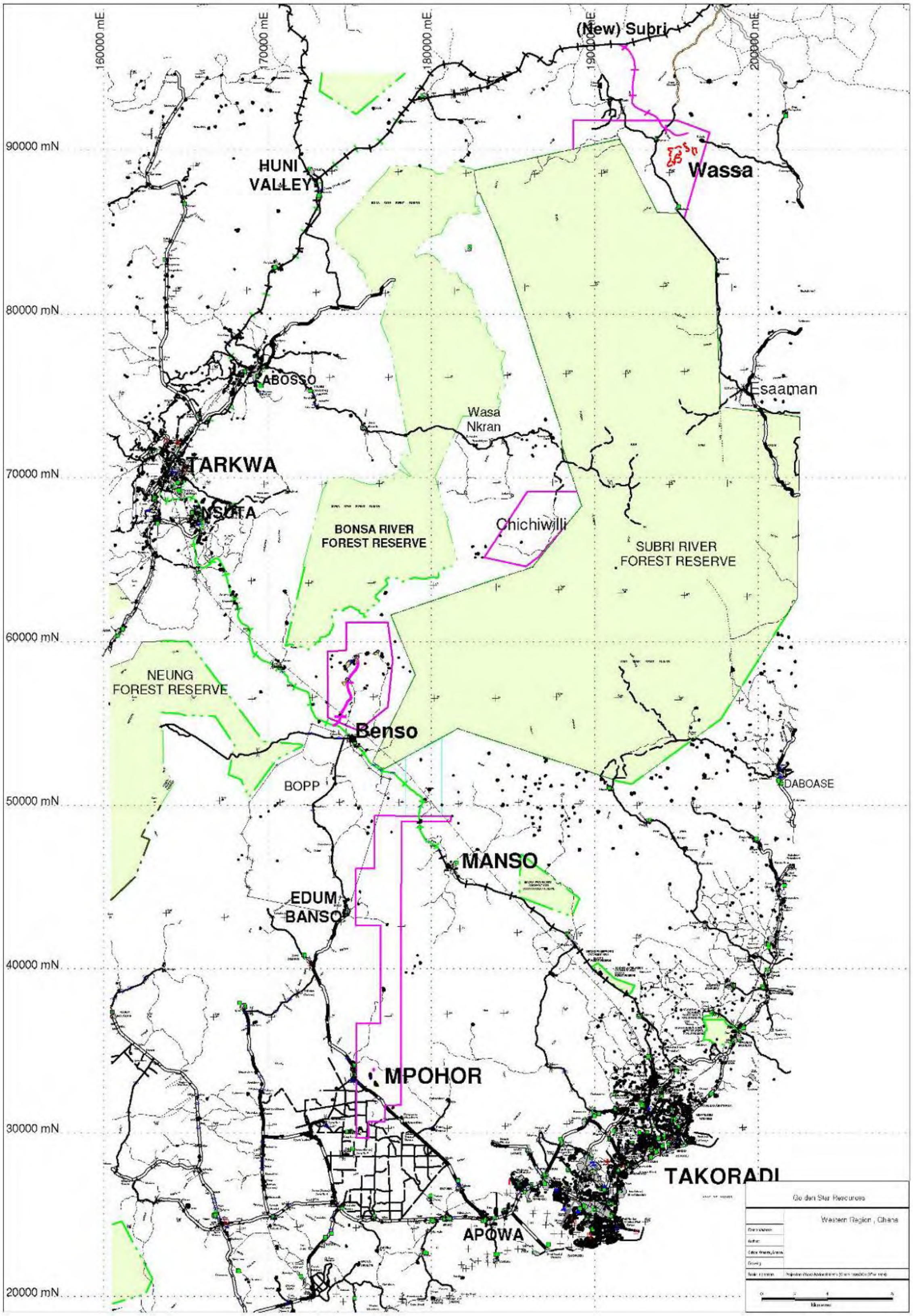


Figure 6-2: Location Map - Western Region, Ghana

6.4 VEGETATION AND LAND USE

As in most parts of Ghana, farming dominates the local economy. Most of the farming is subsistence agriculture carried out by local villagers and towns-people who maintain small farm plots (mostly for cassava, yam, corn, plantain, pineapple and banana) close to their residences. Any surpluses from these farms are sold in nearby markets.

The area also features quite extensive agro-forestry, especially in palm oil, which is a major cash crop in the area, and is one of the largest oil palm growing areas in the country. Two very large oil palm plantations occur in the area Norpalm (formerly a parastatal that was divested to a Norwegian group) has a large plantation (about 5,000 hectares) to the south and west of Mpohor. The Unilever Group has a similar very large plantation (about 8,000ha) just to the north of Edum Banso, along the western border of the Hwini-Butre concession and it adjoins the southern end of the Subriso concession. Both these plantations have treatment plants that produce palm oil and a similar plant (Ayeim) is located just to the west of Mpohor which buys in palm nuts from many small private plantations.

Many local farmers also grow oil palms in small plots all over the area and sell the palm nuts to nearby oil mills. In addition, cocoa is grown in many parts of the area and it is also an important cash crop. Coconut groves are fairly extensive in the area and the coconuts are recovered for local use and taken to nearby market towns.

There is a timber industry in the various forest reserves at the north end of the Benso area where the forest reserves are logged on a 40 year cycle. Logging compartments are opened up for commercial logging for 5 years and then closed for another 35 years. The management program ensures that rare and endangered species are not taken and only abundant renewable timber is taken for commercial use. Most of this timber is hauled to major timber mills in Takoradi-Sekondi for export and to a lesser extent to smaller processing sites in some of the nearby villages. Local bamboo is used for fencing and housing construction in many of the smaller villages and towns.

There are two forest reserves close to the HBB concessions (Refer Figure 6-2 and Figure 6-3). To the east of Benso is the Subri River Forest Reserve which is approximately 1.3km from the planned Subriso East pit and to the north of the Benso concession is the Bonsa River Forest Reserve which is approximately 2km away. Both of these forests reserves are currently being logged on the 40 year forest management system.

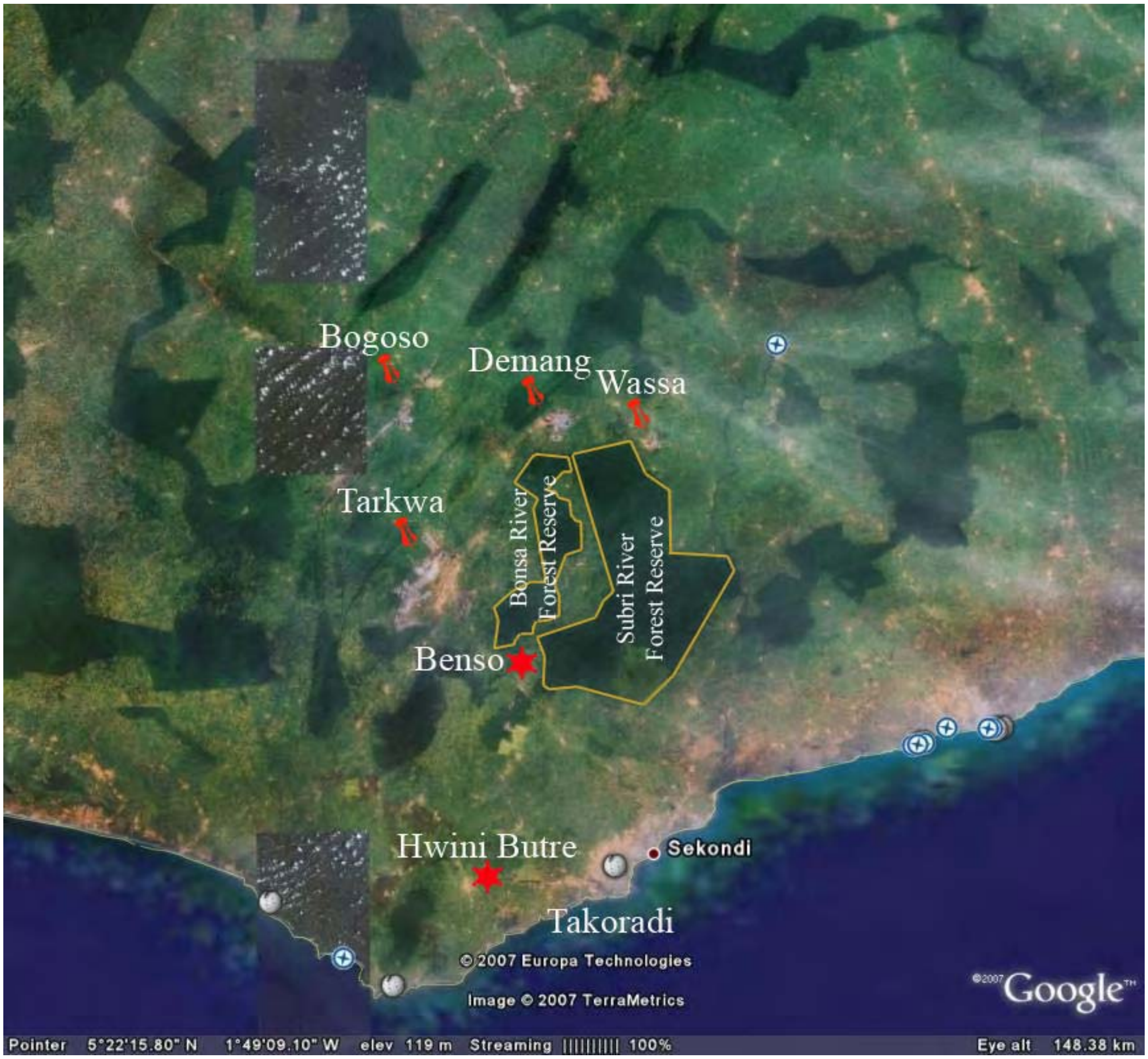


Figure 6-3: Satellite Image, Western Region, Ghana

There is very little other industrial or manufacturing activity in the area, even in Takoradi-Sekondi. However, with the anticipated gas pipeline arriving from Nigeria in 2007, and with the extension and rehabilitation of the Takoradi port as well as the railway facilities throughout the region, one can expect that industrial activity should increase quite substantially in the coming years. The area is especially well-located for manufacturing, which would focus on export markets.

With the improvement in the port facilities, Takoradi should be able to increase its role in transporting more goods into the domestic market as well as to neighboring markets such as Burkina Faso and Niger. This can be further facilitated by improving the roads and railways in the region.

The Takoradi area also has considerable tourism activity but there is potential to increase this dramatically if infrastructure in the coastal areas is further improved. At present, the

Government of China is completing a large new modern sport stadium on the eastern outskirts of Sekondi; this facility will be ready for the African Football Championships in 2008 and after that it should attract other major sporting and cultural events.

7.0 HISTORY AND OWNERSHIP

7.1 PROPERTY HISTORY

The alluvial gold deposits in the immediate vicinity of Mpohor have been very important historically and some of the early European reports indicate that the Dabokrom area may have been a major source for gold sold at Elmina to the Portuguese explorers who first came to the region in the late 1400's. Certainly there are extensive old Ashanti pits and the small valleys draining a large area immediately east and south of Mpohor have been worked and re-worked. In recent years, there has been considerable illegal small-scale mining in the area of the known bedrock deposits. All of this mining has been focused on the alluvial and, in some cases, eluvial gold occurrences. These activities increase when there is a good supply of water to wash the gravels and sand but wanes in the dry season when very little surface water is available.

Direct European interest in the area probably dates to the late 1800's because this was a known source of gold and it was close to Sekondi-Takoradi, which was to become a major port and railhead city to service the inland gold operations at Tarkwa, Prestea and Obuasi. The area was covered by exploration licenses in the gold boom of 1898-1902 and the 1930's saw much more sustained interest when virtually the whole area was under license; in many cases, to local Ghanaian businessmen and entrepreneurs.

At Dabokrom, a vertical and inclined shaft was sunk by Oceania Consolidated in the mid 1930's to intersect and follow the shallow dipping quartz veins. They continued to work on the property for several years but stopped at the beginning of WW2 in late 1939. Earlier, a shaft was sunk just after WW1 (1918) on a quartz vein at the Chichiwilli prospect at the very north end of the Benso concession, just along the boundary of the Subri River Forest Reserve. Many collapsed adits and shallow shafts are scattered over several parts of the concessions and they attest to European activities, dating mainly to the 1930's.

It was not until the late 1980's that exploration attention was again directed to this area. The Dabokrom concession was acquired by a local businessman, Nana Hayford, through his company BD Goldfields Limited ("BDG"). This group invited a Danish Company (Lutz Resources Limited) to work on the property. They carried out preliminary exploration work in the early 1990's and then had the property transferred to Hwini-Butre Minerals Limited ("HBM"), also controlled by Scandinavian investors. Shortly thereafter, HBM entered a joint venture with Placer-Outokumpu who drilled several vertical holes in 1993 around the Dabokrom area with a view to assessing the large-scale potential of the vein systems. They concluded that the veins were too widely spaced and the intervening diorite hostrock contained little gold so that the large scale potential seemed limited.

SJR acquired Dabokrom in late 1994 and have been exploring the area and managing the project up until early 2006; however, there was about a three-year hiatus on the work as the result of a legal dispute between BDG, the Government and HBM. The dispute was finally resolved in mid December 2005, prior to the GSR acquisition of SJR. In March 2006, the concession was transferred to First Canadian Goldfields Limited, a subsidiary of SJR, which in turn was acquired by GSR at about the same time.

To the north, extensive reconnaissance work (1989-92) by BHP identified significant soil geochemical anomalies at Chichiwilli, Subriso, Denerawah and Amantin. Some follow-up work was carried out, especially at Chichiwilli where twelve drill holes were completed. None of the targets were deemed large enough to meet BHP's size threshold and they relinquished all of their interests. Shortly thereafter, a local Company, Architect Co-Partners, acquired a 150km^2 prospecting concession covering Amantin, Subriso and Chichiwilli. This also included a large part of the Subriso River Forest Reserve, which was closed to exploration after 1996.

Fairstar Exploration Limited of Canada (”Fairstar”) took over the Benso concession in 1995 and carried out extensive work, especially at Subriso and Amantin where considerable drilling was carried out under the management of the consulting company, CME (Ghana) Ltd of Accra and Vancouver, Canada. By the end of the decade, work on the concession had largely ceased because of a lack of funds. By mid 2001, SJR, completed an agreement with Fairstar and took over the exploration work.

From early 2002 to about mid 2004, SJR's focus was in the Subriso area where substantial Mineral Resources were outlined at two important prospects, Subriso East and West. Numerous other prospects were located nearby, which were drill tested, as was the Amantin area, which had also been drilled to a considerable extent by Fairstar.

By early 2004, SJR was able to recommence work on the Hwini-Butre concession. Work priorities included further evaluating existing targets and identifying new prospects in the vicinity of Abada and Guadium at the north end of the Hwini-Butre concession. For much of 2005, drilling was focused at the southern end of the concession. This work included upgrading and expanding resources at Adoikrom and Father Brown and testing other prospect areas such as Semkrom and Adoikrom North. In addition, in late 2004 and for much of 2005 and early 2006, efforts were directed towards carrying out engineering, metallurgical and environmental studies needed in an application for a mining lease to cover the main Benso and Hwini-Butre prospects.

In 2005, considerable attention was also directed towards clearing all legal and title issues that held up progress on the project. These efforts were finally successful in late 2005 contemporaneously with the acquisition of SJR by GSR. Since then, GSR has carried out more detailed drilling in the areas of the main known occurrences and evaluating how best to proceed with the mine development on the concessions.

7.2 OWNERSHIP

GSR has a 90% beneficial interest in the HBB properties with the Government of Ghana having a 10% carried interest which entitles them to a 10% dividend once GSR's capital costs have been recovered. Figure 7-1 shows the GSR ownership structure of the HBB properties and the Wassa operation.

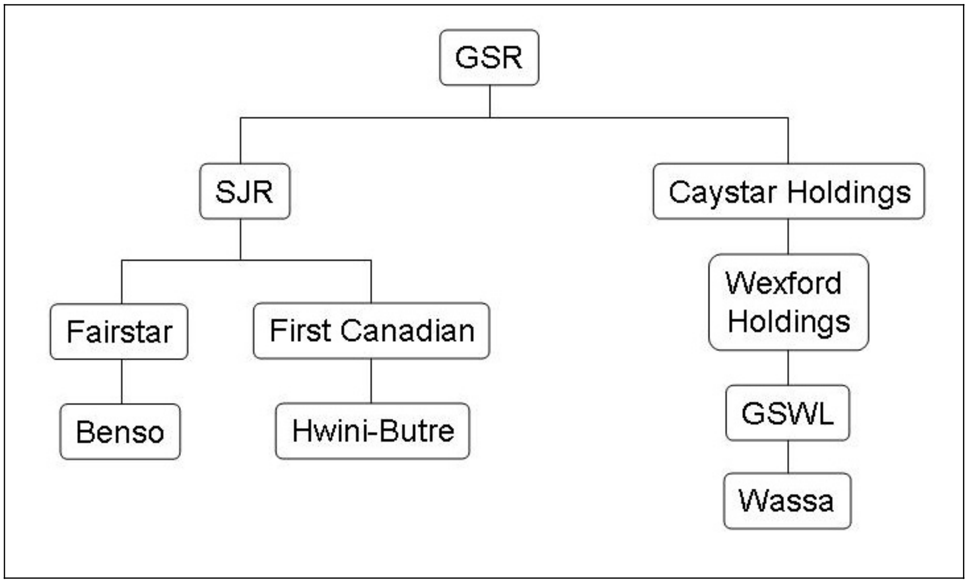


Figure 7-1 GSR ownership structure of HBB and Wassa.

8.0 GEOLOGICAL SETTING

At the request of GSR, SRK performed an independent Mineral Resource estimation on the HBB properties. The following geological section consists primarily of extracts from the SRK report *Mineral Resource Estimation of the Benso and Hwini-Butre prospects, South West Ghana, January 2007*.

8.1 REGIONAL GEOLOGY

West Africa consists of an Archean (2,400+ Ma) cratonic block centered along the Gulf of Guinea coast, and extending inland from western Cote d'Ivoire to southern Guinea. Most of this region is underlain by the Man Shield, complex younger Precambrian (about 2,000Ma to 2,200Ma) units, regionally referred to as the Birimian Supergroup and the Tarkwaian Group rocks.

The Birimian Supergroup features a series of narrow, sub-parallel northeast and north trending greenstone belts of mafic to intermediate volcanics, volcaniclastics, and interbedded sediments intruded by intermediate belt granitoids. Three main belts are recognized (from the northwest to the southeast); Sefwi-Bibiani, Ashanti and Kibi.

The greenstone belts are separated by broader basins of marine sediments, often with a strong volcanic affiliation and intruded by massive, intermediate granitoid complexes associated with the Eburnean orogeny at about 2,000Ma (Figure 8-1). The basin sediments are generally believed to be older than the belt rocks, hence the Birimian is divided into Lower (Early) and Upper (Late) sequences.

Pyroclastic deposits associated with the mafic lavas are chemically similar to tuffs located in the adjacent basins. The Tarkwaian Group rocks, preserved mainly in the Ashanti Belt are composed of clastic sediments, mostly quartzite, arkose, conglomerate and phyllite.

Hinge line zones that formed along the broad boundaries between basin and belt environments are characterized by interbedded sedimentary and volcaniclastic units and contain chemical depositions of cherts, carbonates, magniferous deposits, carbon and sulphides, all of which can be important associated features for economic gold mineralization.

Structure, indicative of zones of higher permeability, is the dominant controlling factor for the deposition of gold in the Ghanaian gold belts. The most productive areas in the Birimian Supergroup have been discovered along the depositional boundaries between the belt and basin facies.

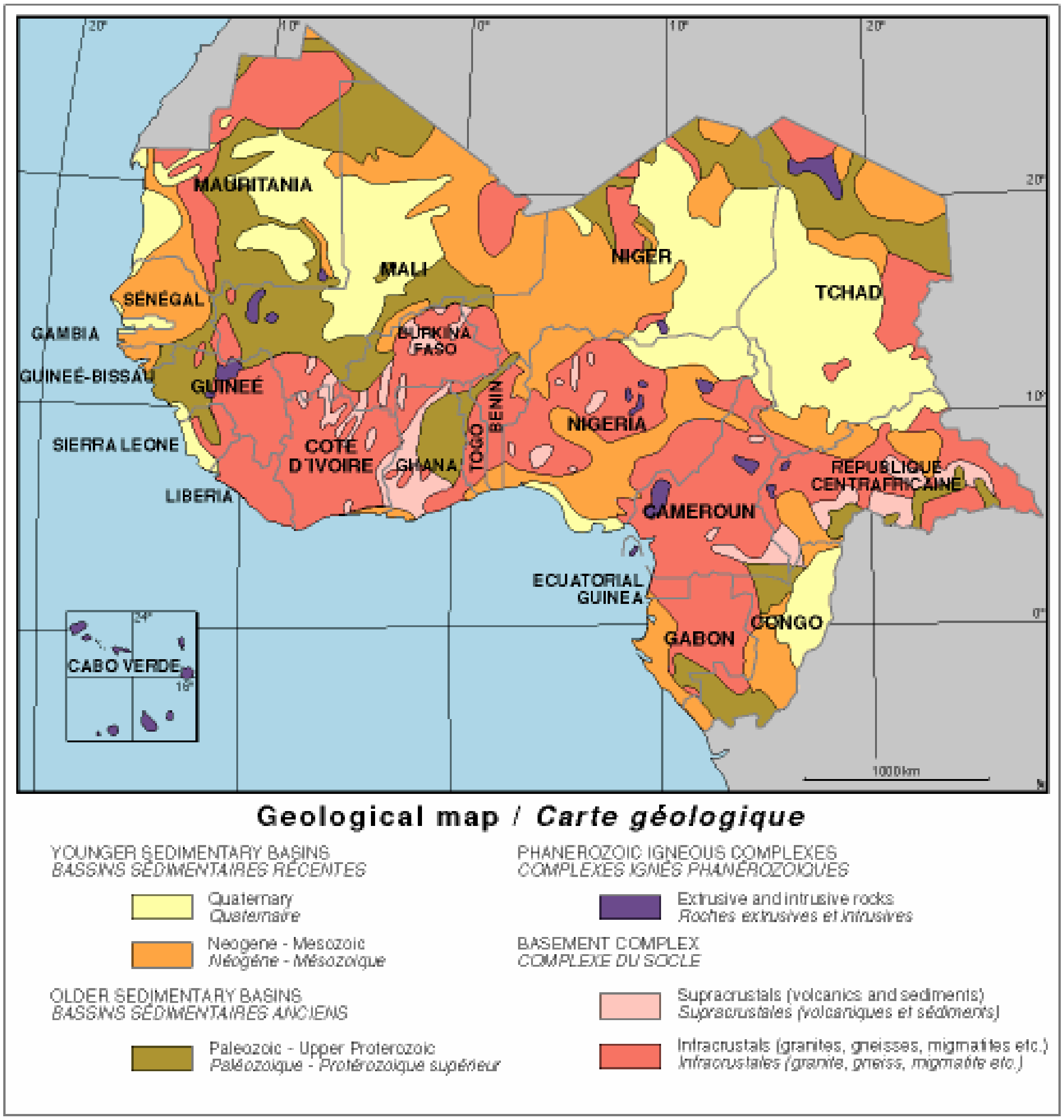


Figure 8-1: Regional Geology of Ghana in the context of West Africa

8.2 LOCAL AND PROPERTY GEOLOGY

The HBB properties lie within the southern portion of the Ashanti Greenstone Belt. The eastern margin of this belt comprises interbedded volcaniclastics while the western margin features a band of highly metamorphosed volcanics. Deposition of the Tarkwaian sediments was followed by a period of dilation and the intrusion of mafic dykes and sill. Subsequent compression and re-activation of faults led to the intense folding and thrust faulting with associated shears and this was accompanied by a regional metamorphic event. The area hosts a range of intrusive lithologies and morphologies including the porphyritic Dixcove granite complexes in the Takoradi area. The age of the various intrusives ranges from 2.2Ga to 2.15Ga.

The southern area of the Ashanti belt is host to numerous gold occurrences which are believed to be related to late stages in the regional metamorphism and the commencement of the structural re-activation events. The majority of gold deposits occur as narrow discontinuous quartz veins generally, but not exclusively, hosted by metavolcanic sequences.

Outcrops are limited but where they do appear it is clear that a number of the major lithological boundaries are faulted with evidence of cataclasis and intense shearing along contacts. The dominant structural grain is oriented northeast with local fracture systems frequently displaying a north-south strike associated with minor splays off the main trend.

9.0 DEPOSIT TYPES AND MINERALIZATION

9.1 BENSO

The Benso deposits are hosted by Birimian metavolcanics into which coarse plagioclase porphyry units have intruded and which are generally conformable with the volcaniclastic units. The feldspar porphyries are thought to be related to the nearby Dixcove granite complexes and are geographically related to many of the gold deposits. (Refer Figure 9-1)

At Subriso East the metavolcanics host complex quartz vein systems associated with intense shearing and abundant sulphide mineralization. At Subriso West the presence of intermediate porphyry intrusive appears to play a more significant role and quartz veining is less extensive and broad-scale silicification is more common. The contacts between metavolcanics and porphyry have been identified as potential targets for higher grade gold mineralization.

The ore hosting structures generally dip steeply to the west with foliation generally parallel to the bedding. The aeromagnetic interpretation reveals a north to north-northeast striking fault system along the course of the Ben River with several other fracture systems also evident with strikes varying between the northwest and northeast. The Subriso East deposit is interpreted to dip less steeply to the west at approximately 50°.

Mineralization occurred in pulses throughout the late stages of the Eburnean orogeny and was focused along fracture systems associated with the regional structures being re-activated at that time. Mineralogy is relatively simple with fine-grained but visible gold disseminated in discrete quartz veins. Pyrite is abundant and associated with the gold in clusters of fine crystals. Zones of intense alteration with chlorite, carbonates and epidote are common. Arsenopyrite is absent from the deposits and in microscopic section the gold would appear to be free-milling.

Oxidation associated with weathering is variable but generally limited. The weathering forms a layer of lateritic clay rich material grading into a soft saprolite. The vertical depth is generally 10m or less but can reach depths of 30m in places. There is a sharp boundary between oxide and fresh material with a narrow and poorly developed transition zone.

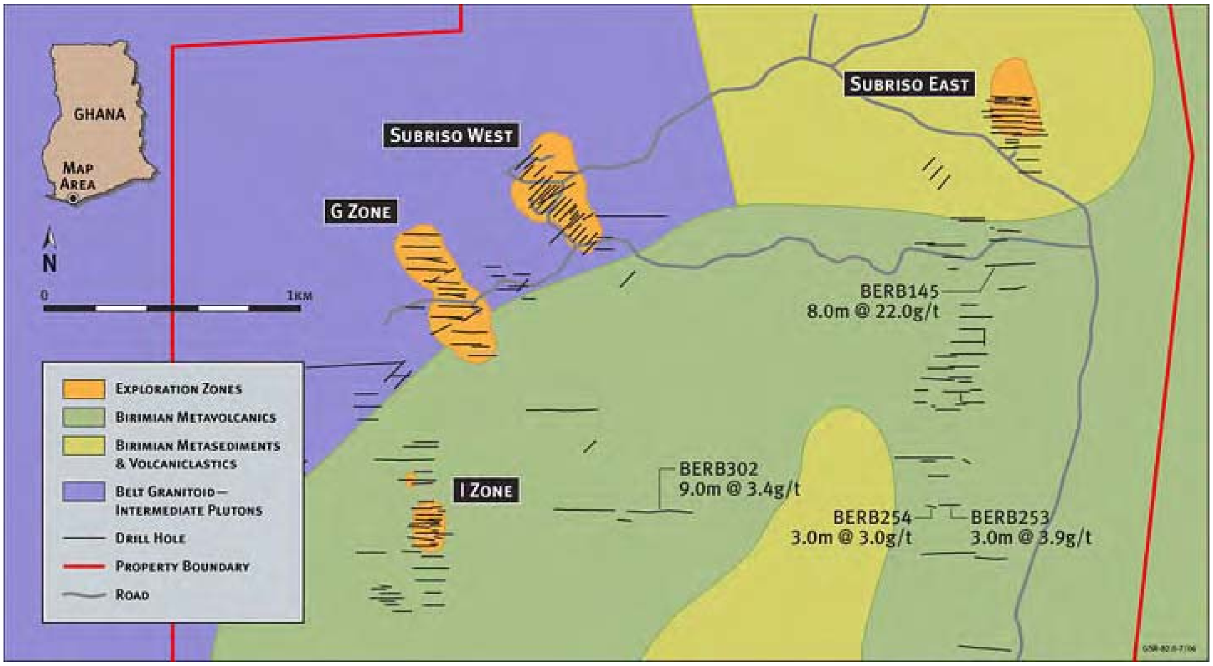


Figure 9-1: Local Geology of the Benso area

9.2 HWINI-BUTRE

The Hwini-Butre deposits are unusual in that they are shear hosted quartz veins within diorite and granodiorite intrusives of the Mpohor complex. The near surface expression of the orebodies is heavily oxidized and composed of lateritic clays with minor amounts of quartz in thick stringers. Below the laterite, the saprolite retains the original rock textures. The oxidation is highly variable and reaches depths of up to 40m. The transition is poorly developed and discontinuous. The high potassium anomalies recorded over the orebodies indicate intense hydrothermal alteration of the underlying dioritic host rocks. (Refer Figure 9-2).

The underlying structure is difficult to interpret owing to the lack of suitable fresh exposure. However, from geophysical surveys and topographical features, it is possible to recognize several north to north-northeast trending regional features running through the area which are tentatively interpreted as boundary faults along the margins of the Ashanti Belt. The Mpohor complex exhibits the underlying north-south trends but also has extensive cross-cutting features present particularly in the north-west orientation. Cross-cutting mafic dykes trend in an east-northeast direction.

The Adoikrom, Father Brown and Dabokrom deposits occur in the south of the Mpohor complex and appear to be controlled by a series of shallow to moderately dipping shear structures with dips varying from 20° to the south steepening to 65° to the west.

The age of the mineralization is not well established but is believed to be similar to that at Benso of a late to post Eburnean age and the period of hydrothermal activity is likely to have spanned a considerable length of time with several phases evident in the system. The high grade quartz vein systems are surrounded by extensive, lower grade, disseminated quartz stockwork bodies.

Quartz veins are generally light grey with carbonate and mica accessory minerals and minor tourmaline and feldspar. Wallrock alteration is commonly associated with elevated gold grades and consists of silicification with carbonates, muscovite and sericite. Secondary strain fabrics are also present with mylonitic and cataclastic fabrics common in the heavily altered zones. Visible gold occurs as disseminations in discrete quartz veins and within zones of silicification associated with pyrite. Gold is fine to medium grained and generally occurs with pyrite and appears to be free milling. As at Benso, arsenopyrite is largely absent from the Hwini-Butre deposits.

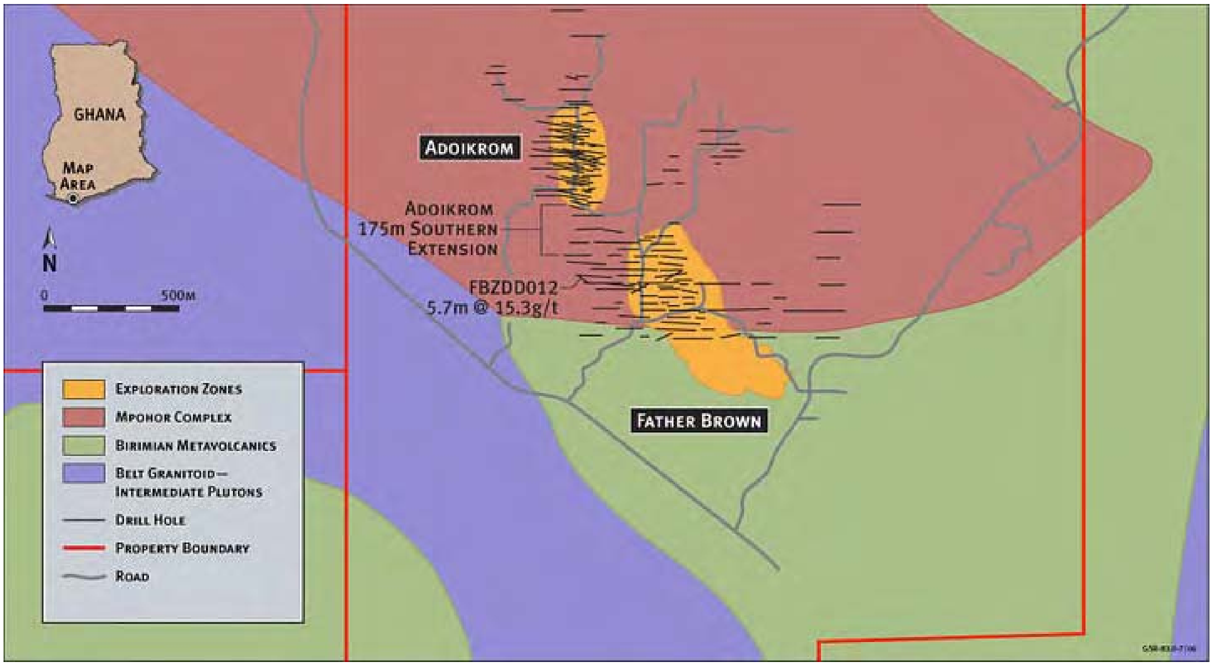


Figure 9-2: Local Geology of Hwini-Butre Area

10.0 EXPLORATION AND DRILLING

10.1 HISTORICAL EXPLORATION

The HBB project history dating back to the 1800's is detailed in Section 7.1, following is a summary of the historical exploration conducted by the previous property owner SJR.

10.1.1 HWINI-BUTRE

SJR had been the operator of the Hwini-Butre concession since February 1995; their activity represented the first sustained exploration program on the concession with a view to defining a mineral resource base.

SJR acquired and performed airborne and ground geophysical surveys (principally magnetics, radiometrics, and Induced Polarization ("IP") surveys and completed additional ground follow-up work. Soil geochemical surveys were also completed on the Concession, resulting in the identification of numerous target areas.

Trenching and pitting has been conducted in areas of geophysical and geochemical anomalies or in areas of historical prospects or old workings in an attempt to outline near surface mineralization. Many of the areas tested had significant surface results and were subsequently drilled. Three significant deposits were defined namely Adoikrom, Father Brown and Dabokrom, along a combined strike length of about 900m. Exploration conducted in 2005 identified a further target, Adoikrom North.

Galamsey mining of alluvial and eluvial mineralization has been ongoing since SJR entered into the JV with BDG.

A total of some 22,100m in 267 drill holes were completed on the main mineralized zones and the exploration targets. From July 2001, SJR conducted a drilling program consisting predominantly of in-fill holes, in an attempt to upgrade the categorization of the mineralization on the main zones.

Recoveries from preliminary metallurgical testwork conducted by Performance Laboratories (Ghana) Limited in 1999 indicated that a conventional milling operation will be preferable over a heap leach option, as the deposit contains a high proportion of sulphide mineralization compared to oxide material.

In December 2004, Watts, Griffis and McOuat ("WGM") produced a Mineral Resource estimate for the Hwini-Butre deposits on behalf of SJR which conformed to the definitions and guidelines of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM Standards on Mineral Resources and Reserves, August 2000 and amendments November 2005) and as outlined in Canada's National Instrument 43-101.

This Mineral Resource was based on a drillhole database containing 289 drill holes. Table 10-1 summarizes the SJR Mineral Resource estimate, December 2004.

Table 10-1: Historical Hwini-Butre Mineral Resource Statement produced by Watts, Griffis and McOuat on behalf of SJR, December 2004

Orebody	Category	Weathering	COG (g/t)	Tonnage (Mt)	Grade (g/t)	Gold (koz)
Hwini-Butre	Measured	Oxide	0.5	0.467	5.5	83
		Fresh	0.5	2.917	4.46	418
		Sub Total	***0.5***	***3.384***	***4.6***	***501***
	Indicated	Oxide	0.5	0.297	2.35	23
		Fresh	0.5	2.246	1.90	136
		Elluvial and re-worked	0.5	3.865	1.36	169
		Sub Total	***0.5***	***6.409***	***1.59***	***328***
	Meas + Ind	**TOTAL**	**0.5**	**9.794**	**2.63**	**829**
	Inferred	*Oxide*	*0.5*	*0.018*	*1.07*	*1*
		Fresh	*0.5*	*0.219*	*1.88*	*13*
	Inferred	**TOTAL**	**0.5**	**0.237**	**1.82**	**14**

10.1.2 BENSO

SJR signed a joint venture agreement with Fairstar in May 2001. SJR concentrated exploration activity on the Subriso anomalies. They confirmed that the high value geochemical anomalies did not always correspond to high values in the trenches however; the deeper drilling confirmed the width and extent of the main mineralized zones. The SJR work also identified numerous additional target areas and led to the definition of Mineral Resources for Subriso East, Subriso West, I-Zone and G-Zone.

In December 2004, WGM produced a Mineral Resource estimate for the Benso deposits on behalf of SJR, which conformed to the definitions provided in NI 43-101 (Feb 2001). This Mineral Resource was based on a drillhole database containing 278 drillholes.

Table 10-2: Historical Benso Mineral Resource Statement produced by Watts, Griffis and McOuat on behalf of SJR, December 2004

Orebody	Category	Weathering	COG (g/t)	Tonnage (Mt)	Grade (g/t)	Gold (koz)
Benso	Measured	Oxide	0.5	0.286	3.28	30
		Fresh	0.5	3.478	3.04	341
		Sub Total	***0.5***	***3.765***	***3.06***	***371***
	Indicated	Oxide	0.5	0.064	2.47	5
		Fresh	0.5	1.434	2.40	111
		Sub Total	***0.5***	***1.499***	***2.40***	***116***
	Meas + Ind	**TOTAL**	**0.5**	**5.264**	**2.87**	**486**
	Inferred	*Oxide*	*0.5*	*0.001*	*3.63*	*0*
		Fresh	*0.5*	*0.125*	*2.67*	*11*
	Inferred	**TOTAL**	**0.5**	**0.126**	**2.68**	**11**

10.2 RECENT EXPLORATION WORK

Table 10-3 summarizes the work carried out at HBB by GSR during the period from January to October 2006. GSR concentrated on the previously defined orebodies at Benso (Subriso East, Subriso West, I-Zone, G-Zone) and Hwini-Butre (Adoikrom North, Adoikrom, Dabokrom, Father Brown). Refer location map Figure 10-1. The diamond ("DD") and Reverse Circulation ("RC") drilling has been concentrated on infilling the previous SJR drilling and also proving the continuity of the deposits at depth. Previous drilling by SJR reached a maximum vertical depth of approximately 130m whereas the GSR drilling intersected the orebody at vertical depths of over 250m.

Rotary Air Blast ("RAB") drilling was carried out to a maximum depth of 30m over both the prospects with drill lines designed to cross the outcrop of the defined deposits but extended into the footwall and hanging wall in order to identify any potential parallel deposits. The RAB drilling also targeted a number of the geochemical and geophysical anomalies originally identified by SJR.

Combination of 4m deep auger and shallow auger, at grid 400m by 50m, was carried out to further test the existing gold in soil anomalies and gaps in the geochemistry sampling over the entire Benso-Subriso Block and partially over the Hwini-Butre concessions.

Table 10-3: Drill summary for GSR drilling carried out at HBB, January to October 2006

Domain	Drill Method	Holes	Total meters (m)	Max hole length (m)
Benso	DD	37	5,245	216
	RC	106	8,561	141
	RAB	702	15,568	30
	4m Auger	778	3,829	4
Hwini-Butre	DD	36	6,892	327
	RC	42	2,906	144
	RAB	346	6,507	30
	4m Auger	1,052	3,544	4

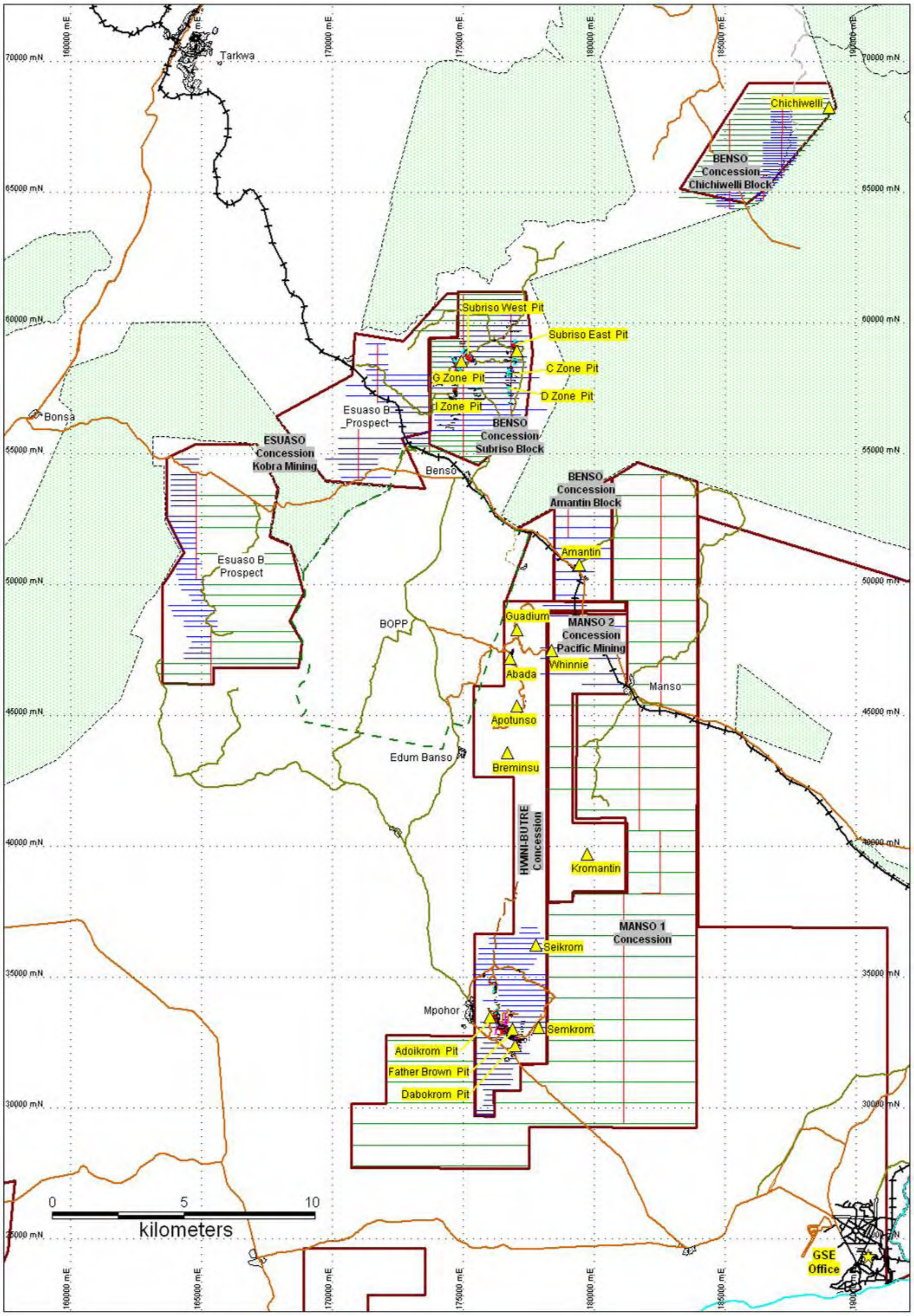


Figure 10-1: GSR Exploration Targets and Concessions

11.0 DRILLING

Planning for resources validation and definition drilling was started after the importation of the entire SJR database into GEMCOM software. The drilling was designed to confirm and prove the down dip extents of a new geological model generated by GSR geologists and increase the confidence level of the resources contained within an optimized pit shell, by reducing the hole spacing's to a nominal 25m x 25m. In addition to the RAB, RC and DD drilling, deep auger drilling was implemented to test the existing gold in soil anomalies. Positive results from the deep auger drilling were tested further with the RAB drill.

Drilling conducted by GSR included RAB, RC and DD commenced in January 2006. Geodrill Ltd was contracted to complete the drilling mobilizing one multi-purpose Universal Drill Rigs UDR[kl]900. RAB drilling was carried out using two of GSR's Tamrock Ranger 700 drill rigs.

RC and DD drilling were carry out in double shift and at all times a GSR geologist was present to align the drill rig and check the drill head dip and azimuth. "Chip-Board's" were produced for quick logging of the RC chips to monitor and stop the hole when the target depths were reached. Down-hole surveying was conducted using a single shot camera ("SSC"), for RC and DD holes at the bottom of holes exceeding 30m depth and then taken progressively every 60m up hole. The SSC recorded the dip and azimuth for each of the surveys on a film image, this image was validated and recorded by the GSR geologists and was filed in the respective drillhole file folders on site.

All the drill-hole collars were surveyed using a Nikon Total Station (DTM-332), by a GSR surveyor. Individual RC and DD holes have been identified and marked in the field with PVC pipes. RAB drill holes were surveyed in the field and identified and marked with wooden pegs.

Samples collected during RAB and RC drilling has been stored in plastic bags identified with hole-ID numbers and depth in meters.

Core from DD has been placed in partitioned wooden boxes, holding on average 5m of core. In the individual core boxes, drilling run depths in meters has been recorded and in the bad recovery ground core lost was recorded on wooden blocks. Sample assay numbers were recorded on aluminum metal tags and stapled to the boxes.

All information pertaining to RC and DD holes including, hard copies of logs, photographs, down hole survey shots and assay reports has been filed in individual folders and are stored in filing cabinets at the GSR Takoradi exploration office. RAB and auger data has been separated by zone and has also been stored in the filing cabinets on site.

11.1 SAMPLING METHOD AND APPROACH

All DD, RC and RAB drilling was supervised by a GSR geologist or qualified technician who was on site at all times while drilling was in progress. The location for the plan holes were set up by a surveyor and the shift geologist was responsible for the drill rig alignment and orientation. Typically the upper portions of holes were drilled by RC methods. The drilling was switched to DD drilling for core samples if the quality of the RC returns deteriorate or when important sections/mineralized intervals were encountered.

Representative RC and RAB drill chip samples for each one meter drill interval were collected, washed and stored in a numbered plastic chip-tray. A washed sample and a fines sample were collected for the RC holes within the oxide portion of each hole. These chips were logged by the shift geologist, recording oxidation state, lithology, foliation, alteration intensity, quartz and sulphide content and other distinguishing features. The drill logs together with hole location and orientation were entered into the drill hole database and used for updating the geological interpretation and grade models.

Drill core recoveries and rock quality designation ("RQD") were recorded at the drill site when the core was removed from the core barrel. All drill core was oriented using spear orientation down-hole tools. Logging of the oriented drill core recorded structures and contacts oriented in real space, lithology, alteration assemblages and controls on gold mineralization. Structural and lithological contacts were recorded from the oriented core by placing the core in an apparatus which was aligned with the same dip and azimuth as the drill hole therefore, enabling compass measurements of strike, dip direction and dip of the features to be measured directly from the core. In addition to the lithological and structural logging information, geotechnical data was also recorded. Geotechnical logging involved the measurement of joints, fractures and discontinuities using a Goniometer to record the angles in reference to the oriented core marking.

11.2 SAMPLE PREPARATION, ANALYSES AND SECURITY

Sampling was carried out along the entire drilled length. For RC, RC pre-collar and RAB holes drilling, the samples were collected every one meter. Three meter composite sample were prepared from three successive samples; the objective was to reduce the assay analysis cost. RAB three meter composite samples were prepared by shaking the one meter sample thoroughly to homogenize and using the 2" diameter PCV spear tube to collect a fraction of the three individual one meter samples. RC three meter composite samples were processed by passing each sample through a 3-stage riffle splitter; from the 1/8th portion of the each one meter sample splits, using the 2" diameter PCV spear tube to make 2.0kg to 3.5kg composite samples. The remaining rejects were kept at the site pending assay results. Should any three meter composite sample return grades equal or greater than 0.2g/t, the individual one meter samples was split down to approximately 2.0kg to 3.5kg using a Jones riffle splitter and then submitted to the laboratory for analysis. DD samples were collected logged and split with a diamond rock saw in maximum one meter lengths.

Control samples were inserted in the sample bay prior to submitting the batch to the laboratory. Batches of three meter composite samples containing only replicate, blanks and standards were inserted in the batch of one meter samples. The control samples represent 10% of total batch samples.

Sample preparation on site was restricted to sample and core logging and splitting. The facilities at both sites consisted of enclosed core and coarse reject storage, covered logging sheds and areas for splitting of RC and RAB samples. All crushing and grinding are carried out in the sample preparation areas at the laboratory in Tarkwa.

SJR samples were assayed by SGS-Tarkwa using fire assay on a 30g aliquot with an atomic absorption determination of final grade and a detection limit of 0.01g/t. GSR have implemented a one kilogram twelve hour BLEG Leachwell analysis carried out by TransWorld Laboratories Ghana Ltd. ("TWL") also based in Tarkwa, Ghana.

Mineralized RAB and RC drilling intervals were identified and the samples were transfer to a secure storage facility in the core shed area. Core boxes with remaining half core, after been labeled with metal tags it is stored in core racks in sequential order according to hole and depth in the core shed. The core shed area is secured by security in three shifts.

11.3 DATA VERIFICATION

The following section has been extracted from the SRK report *Mineral Resource Estimation of the Benso and Hwini-Butre prospects, South West Ghana.* January 2007.

The Mineral Resource estimate quoted in this report is based on information gathered by the previous owners of the concession, SJR in addition to the sampling carried out by the current holders GSR. GSR carried out a study of the SJR sampling results as part of their due diligence procedure prior to finalizing the purchase agreement. The results discussed here include:

- The original QAQC carried out by SJR;
- The due diligence checks carried out by GSR on SJR samples; and
- Checks carried out by GSR as part of their current exploration program.

Samples are obtained from various stages of the drilling and sampling procedure and are summarized here:

- **Replicates:** Two separate samples collected at the drill site and bagged separately from which two individual samples will be produced. The results of these checks can be useful in highlighting natural variability of the grade distribution.
- **Duplicates:** Two separate pulp samples prepared from a single coarse reject after sample splitting and on site preparation. The results are useful in indicating problems with sample preparation and splitting.
- **Repeats:** Two separate aliquots are prepared from a single sample pulp in the laboratory and the two samples are checked against one another. This can indicate issues with reputability within the laboratory and highlight potential bias.
- **Blanks:** Mainly used as a check on the efficiency of the laboratory. Useful for highlighting contamination problems and also cross labeling when samples are mis-labeled in the laboratory.
- **Standards:** Used for checking the precision and accuracy of the laboratory.

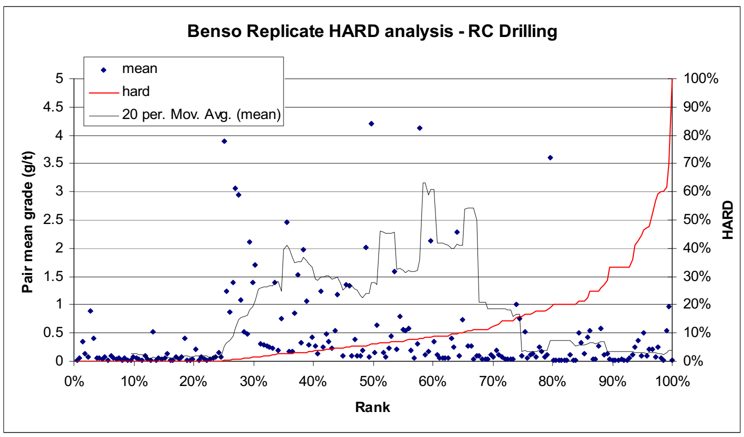
The following section discusses the results of the QAQC work carried out on the Benso and Hwini-Butre drillhole samples. Blanks and standards were regularly submitted with batches of drilled samples to the SGS and the Transworld (TWL) laboratories in Tarkwa, Ghana. Repeats and duplicates from coarse rejects and pulps were also sent for re-assay. In addition to the samples submitted by GSR and SJR, the laboratories carried out regular internal checks and the results of these have also been reviewed.

Analysis is presented using scatterplots to indicate bias between sets of sample pairs using correlation analysis, and a HARD analysis (ranked Half Absolute Relative Deviation) which examines the relative precision of assay pairs representing the same sample interval within the drillholes.

11.3.1 BENSO

11.3.1.1 Replicates

The following figures (Figure 11-1 and Figure 11-2) represent the results of assaying replicate samples taken during the GSR exploration at Benso. The plots are subdivided between RC and RAB drill samples. The HARD results are generally good with >80% of the sample pairs with a HARD value of less than 20%. The sample pairs show good correlation for samples below 4g/t but above this value the inconsistencies become significant and may be indicative of coarser grain size attributable to higher grades with a corresponding increase in data variance for the higher grade portions of the data populations. Alternatively the results may be indicating multiple phases or domains of mineralization with associated average grade differences.



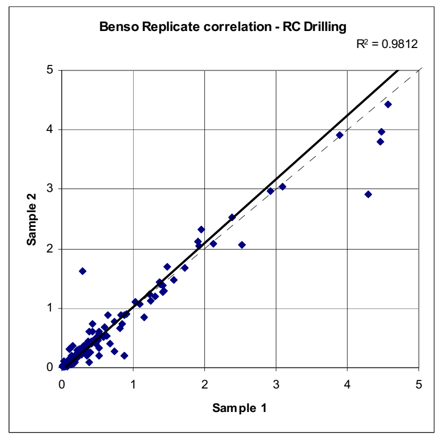
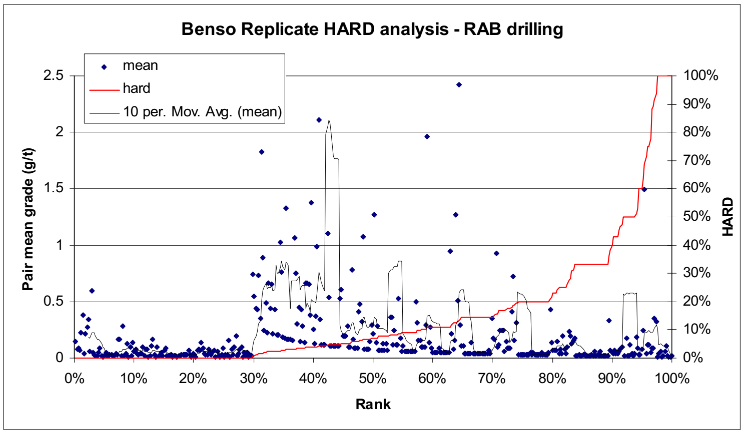


Figure 11-1: HARD and Correlation analysis of replicate RC samples from GSR drilling at Benso, January-October 2006



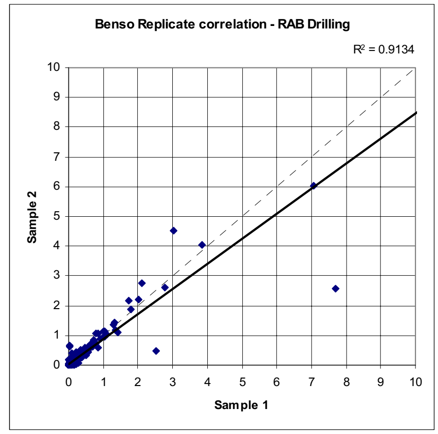


Figure 11-2: HARD and Correlation analysis of replicate RAB samples from GSR drilling at Benso, January-October 2006

11.3.1.2 Duplicates

From the SJR drilling 115 coarse reject samples were re-sampled by GSR and new pulps prepared and sent to TWL for analysis. The following HARD plot (Figure 11-3) shows that some 84% of the data pairs have a HARD value of <20%. There is a slight trend for lower grade pairs to be producing higher HARD values but it is not considered significant.

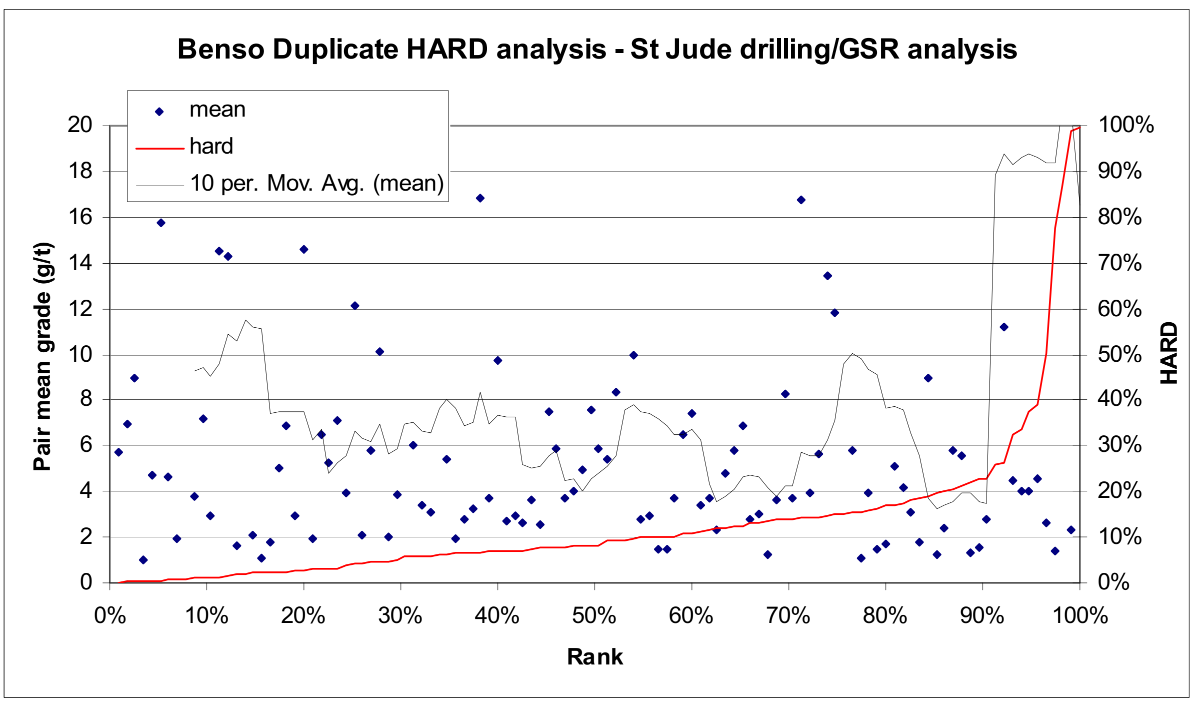


Figure 11-3: HARD plot: Duplicate analysis by GSR from original SJR Benso coarse rejects

The following plots (Figure 11-4 and Figure 11-5) show the results of duplicates produced by GSR from coarse rejects of diamond and RC drilling samples collected during the GSR exploration drilling through 2006. The DD results show a drop in grade associated with the highest HARD values which is to be expected, and overall the results for the DD are very good with 96% of the sample pairs exhibiting a HARD value of 20% or less.

The RC plot shows a similar low HARD profile throughout the samples re-assayed. However, there are significant number of low grade samples included (<0.5g/t) which may not necessarily be representative of the orebody.

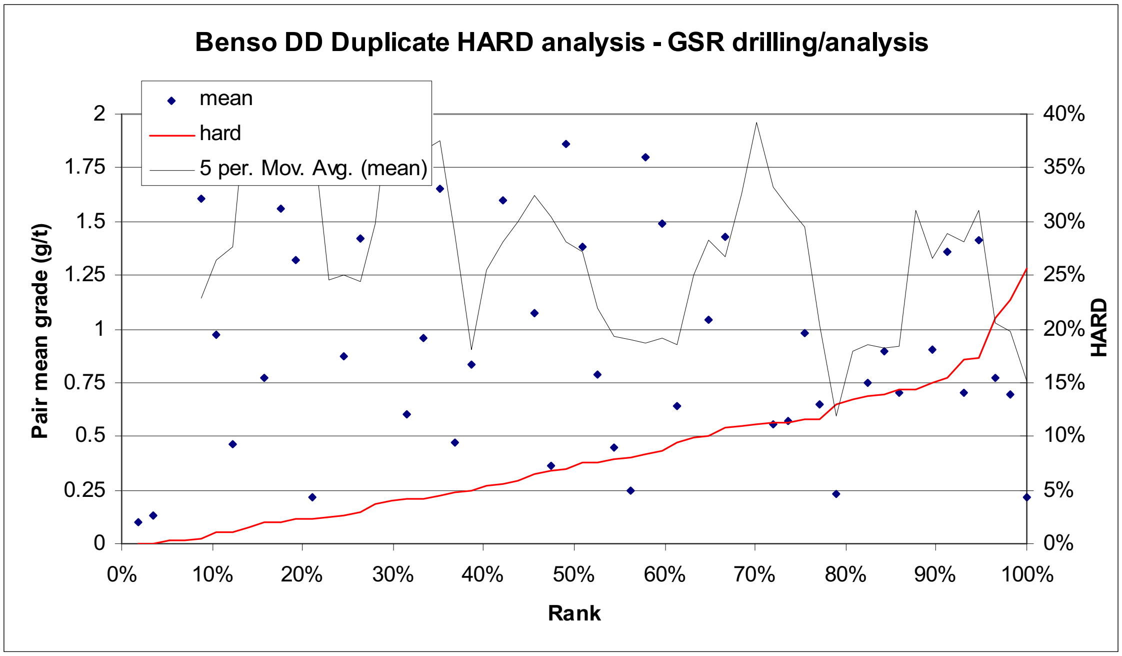


Figure 11-4: HARD Plot: analysis of GSR diamond drill duplicates produced from coarse rejects derived from GSR exploration at Benso, January-October 2006

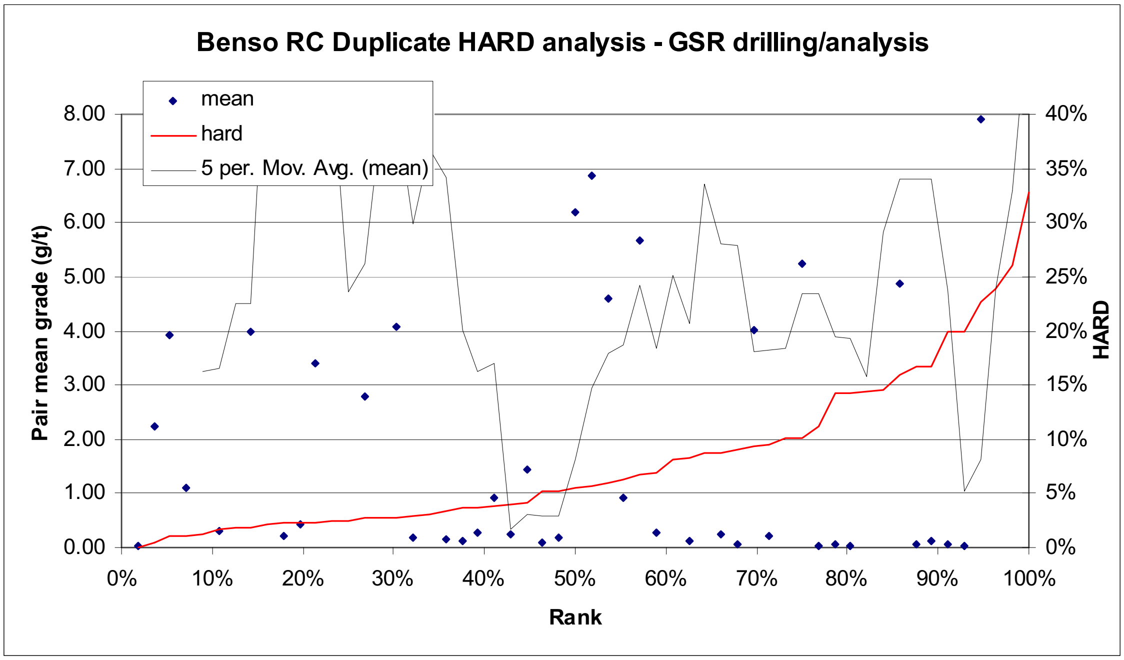


Figure 11-5: HARD Plot: analysis of GSR RC drill duplicates produced from coarse rejects derived from GSR exploration at Benso, January-October 2006

11.3.1.3 Pulp Repeats

Repeats were carried out by both SJR and GSR on the SJR samples. The first plot Figure 11-6) below shows the results produced by SJR during their exploration work prior to GSR's involvement and it is not known which drill method was used to collect these samples. The sample pulps were renumbered and re-sent to SGS for the second analysis. A significant number of low grade samples were included (<0.2g/t) and over 25% of the sample pairs exhibit a HARD value of 20% or greater.

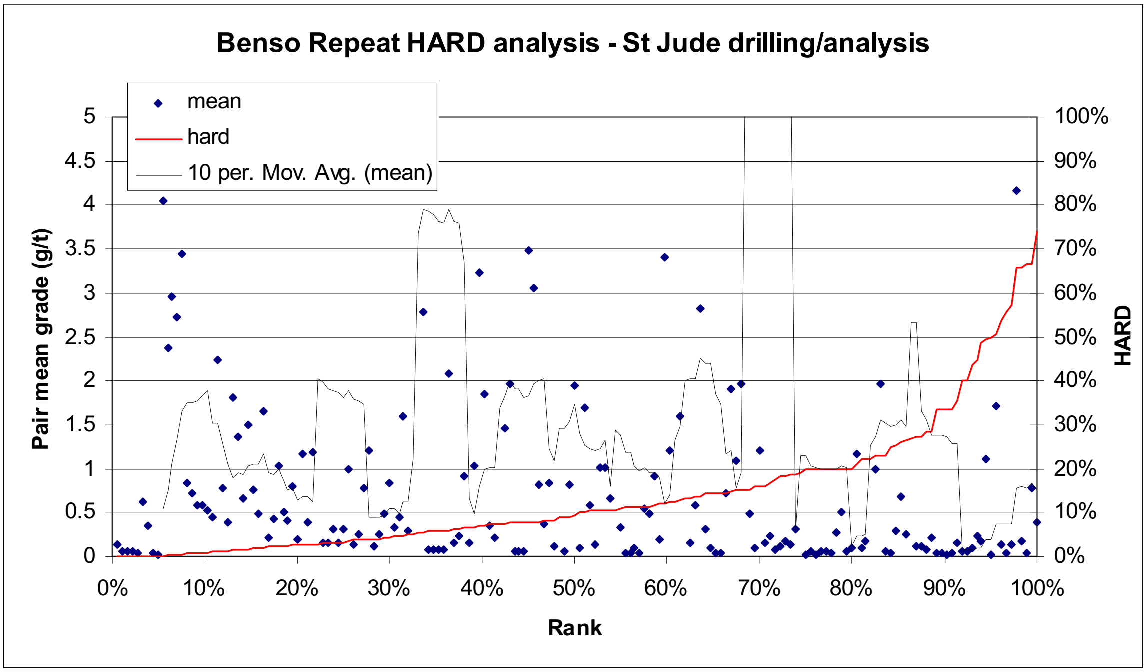


Figure 11-6: HARD plot: Repeat analysis by SJR of original Benso sample pulps

The results from the GSR analysis of SJR pulps produced much better results than the corresponding SJR analysis which may be due to the laboratory or due to the fact that GSR chose the majority of samples to be of ore grade (>1g/t). GSR had the sample pulps analyzed at the TWL laboratory and less than 10% of the samples have a HARD value of 20% ore greater. (Figure 11-7).

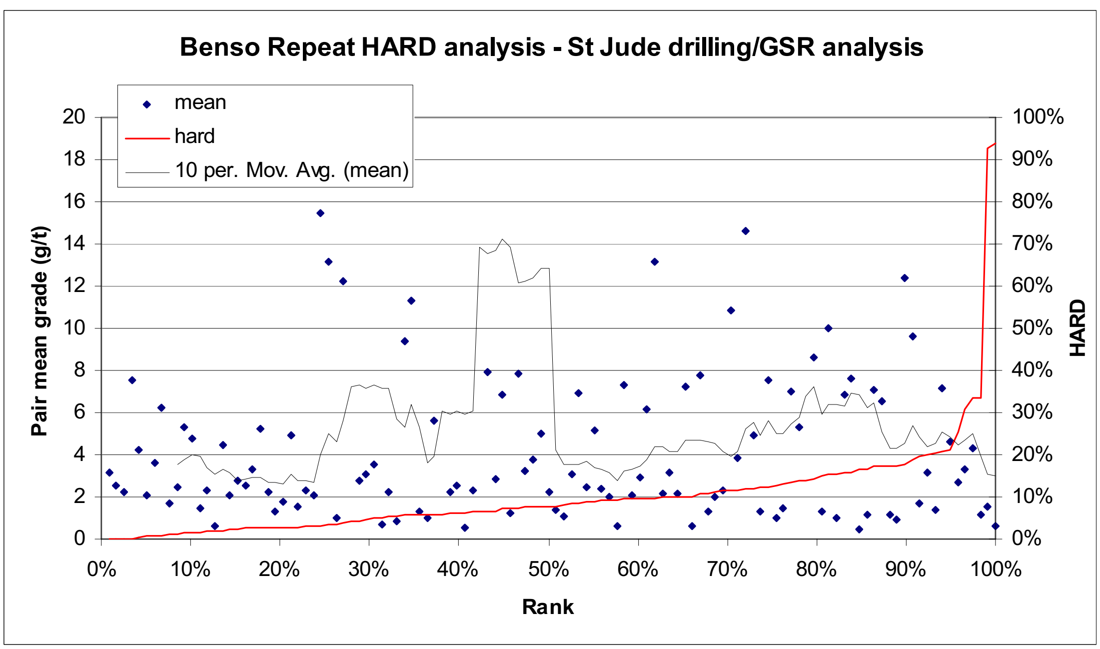


Figure 11-7: HARD plot: Repeat analysis by GSR of original SJR Benso sample pulps

The following figure (Figure 11-8) shows the correlation plot between the original SGS analysis and the re-assay from the same pulp at TWL. It is clear that the SGS laboratory were underestimating the samples relative to TWL and this becomes increasingly obvious above 4g/t. The improved HARD results from the TWL analysis seem to indicate that the SGS laboratory may have been underestimating the grades for the historic SJR Resource estimates.

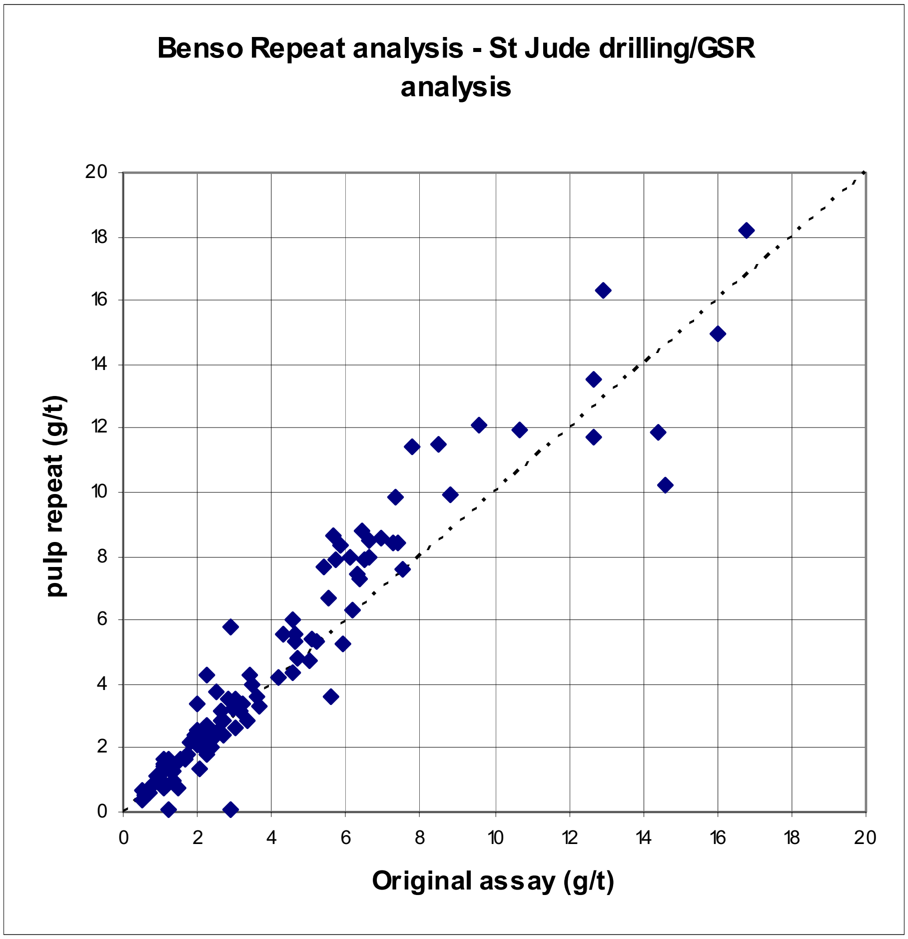


Figure 11-8: Correlation: Repeat analysis by GSR of original SJR Benso sample pulps

11.3.2 HWINI-BUTRE

11.3.2.1 Replicates

GSR produced replicate samples from their RC and RAB drilling during 2006 with both sets of samples being assayed at TWL after initial sample preparation by GSR. The RC consists of only 39 sample pairs and a significant number of these are from low grade samples (<0.2g/t) which could not be considered ore grade. Notwithstanding this, the results indicate at least 70% of the data has a HARD of 20% or less and the correlation appears to be consistent with outliers occurring above a grade of 5g/t. (Figure 11-9 and Figure 11-10)

The RAB data contains much more sample pairs however, only 65% of the data has a HARD of less than 20% indicating the small scale variability of the gold distribution in this deposit.

However, it should be noted that the high number of low grade sample pairs (<0.2g/t) is once again influencing these results as a small difference in grade between the low grade pairs will have a much larger effect on the HARD estimate than a similar grade difference for high grade samples. RAB samples were not used for Mineral Resource estimation in this current report.

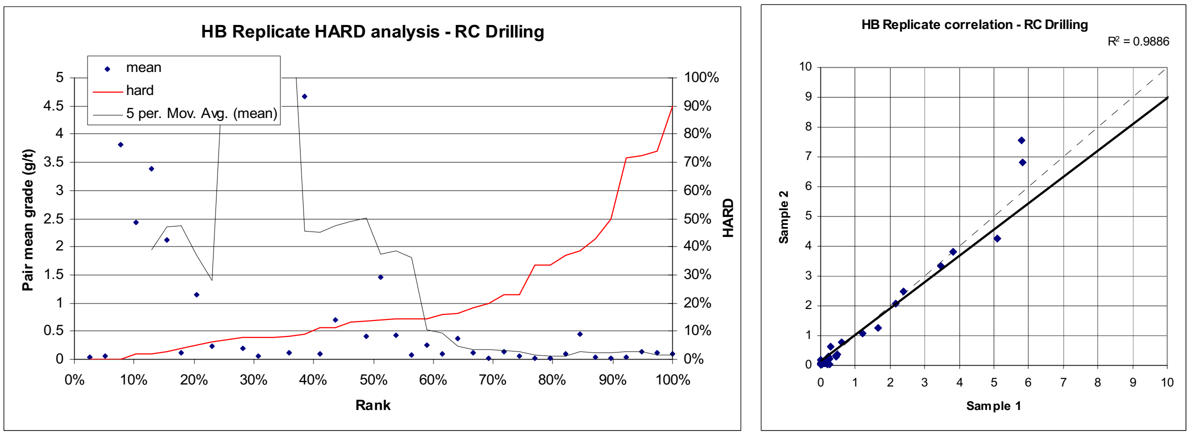


Figure 11-9: HARD and Correlation analysis of replicate RC samples from GSR drilling at Hwini-Butre, January-October 2006

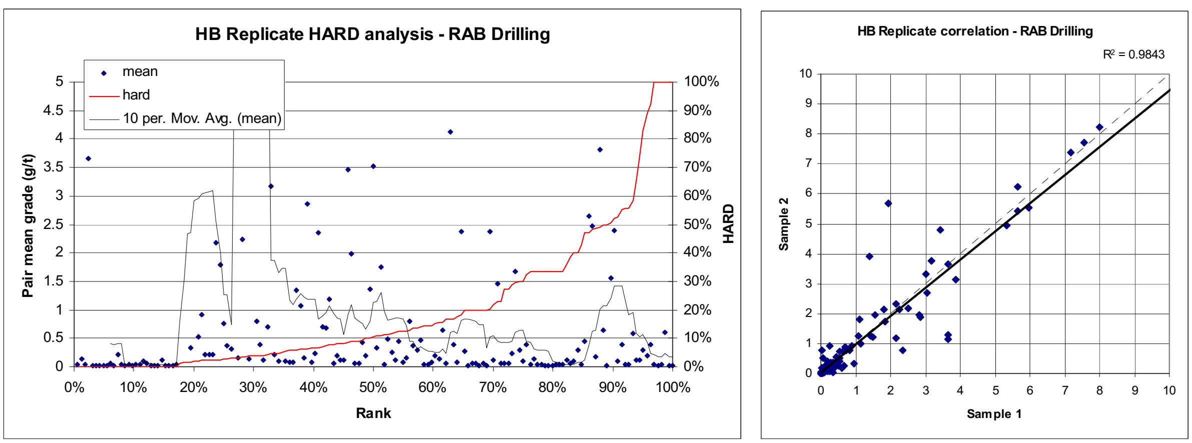


Figure 11-10: HARD and Correlation analysis of replicate RAB samples from GSR drilling at Hwini-Butre, January-October 2006

11.3.2.2 Duplicates

Duplicates were produced by GSR from the original SJR RC drilled coarse rejects and submitted to TWL for analysis. The HARD plot (Figure 11-11) does not show any significant trend and the majority of the data has a HARD of <20%. However, the correlation plot (Figure 11-12) highlights the underestimation of the assays by SGS relative to the re-assay at TWL as seen in the Benso samples.

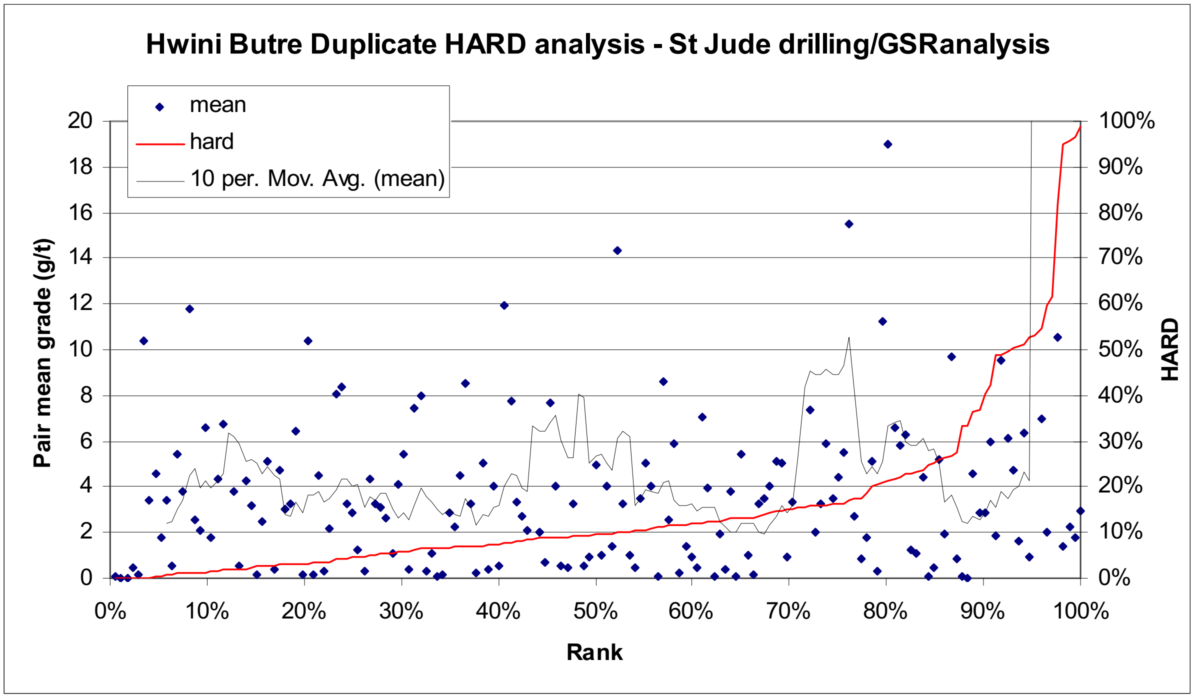


Figure 11-11: HARD plot: Duplicate analysis by GSR of original SJR Hwini-Butre coarse rejects

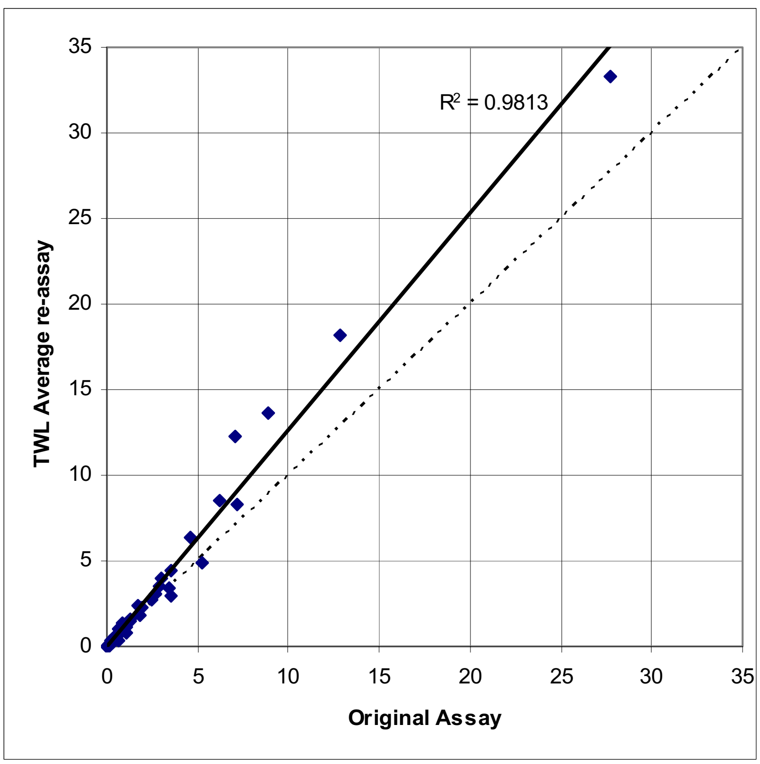


Figure 11-12: Correlation: Duplicate analysis by GSR of original SJR Hwini-Butre coarse rejects

The duplicates produced by GSR as part of their current exploration program are shown in the following figures (Figure 11-13 and Figure 11-14) and show very good reproducibility of grades from both DD and RC drilling samples with only 12% of the data having a HARD value of >20% in both cases.

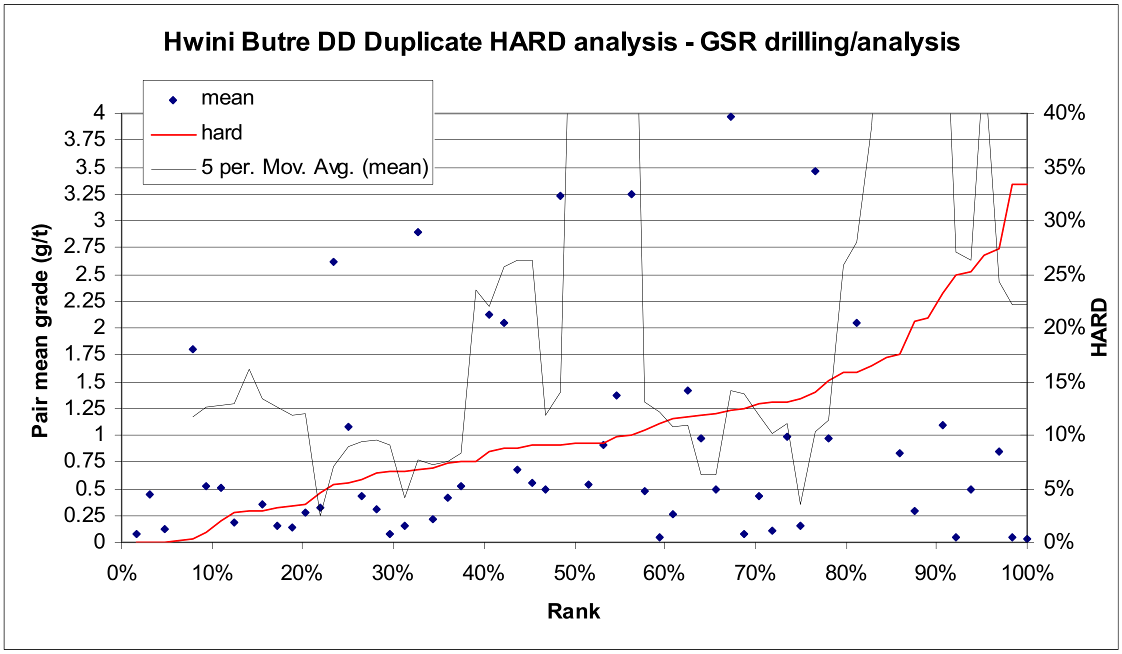


Figure 11-13: HARD Plot: analysis of GSR diamond drill duplicates produced from coarse rejects derived from GSR exploration at Hwini-Butre, January-October 2006

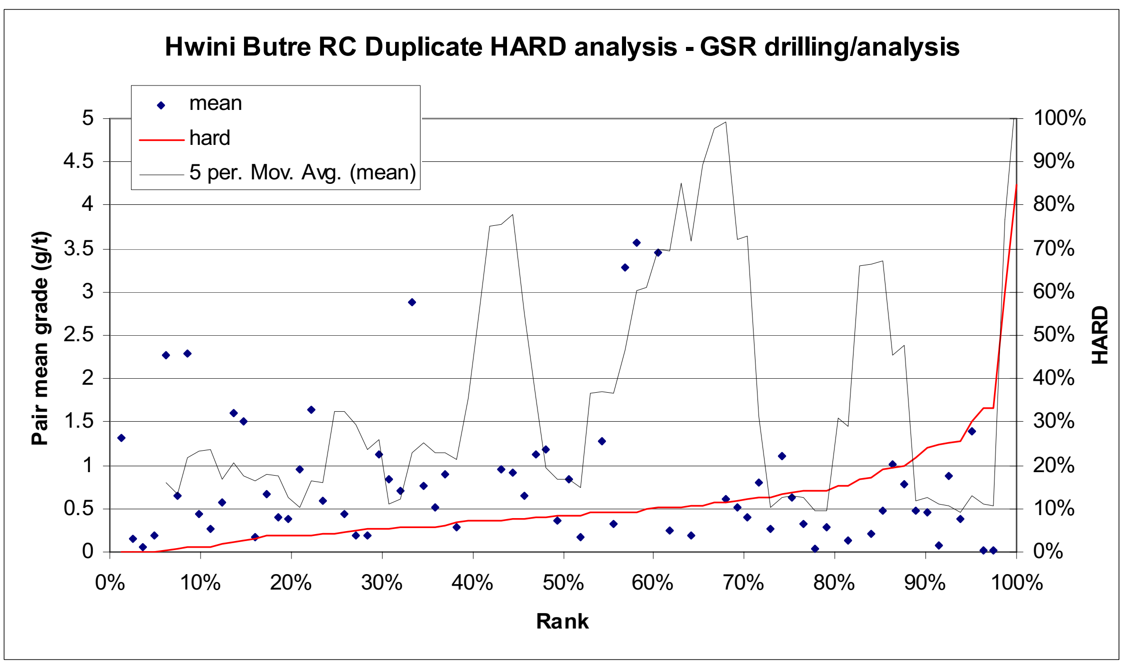


Figure 11-14: HARD Plot: analysis of GSR RC drill duplicates produced from coarse rejects derived from GSR exploration at Hwini-Butre, January-October 2006

11.3.2.3 Pulp Repeats

Repeats were carried out by both SJR and GSR on the SJR samples. The first plot below (Figure 11-15) shows the results produced by SJR during their exploration work prior to GSR's involvement and it is not known which drill method was used to collect these samples. The sample pulps were renumbered and re-sent to SGS for the second analysis. A significant number of low grade samples were included (<0.2g/t) and over 50% of the sample pairs exhibit a HARD value of 20% or greater. (Figure 11-16)

The GSR analysis of the SJR produced pulps produced slightly better results due to the exclusion of the lower grade data. However, 25% of the sample pairs still have a HARD value of >20% and the correlation plot (Figure 11-17) indicates a large spread of data values around the expected values although no significant trend can be identified.

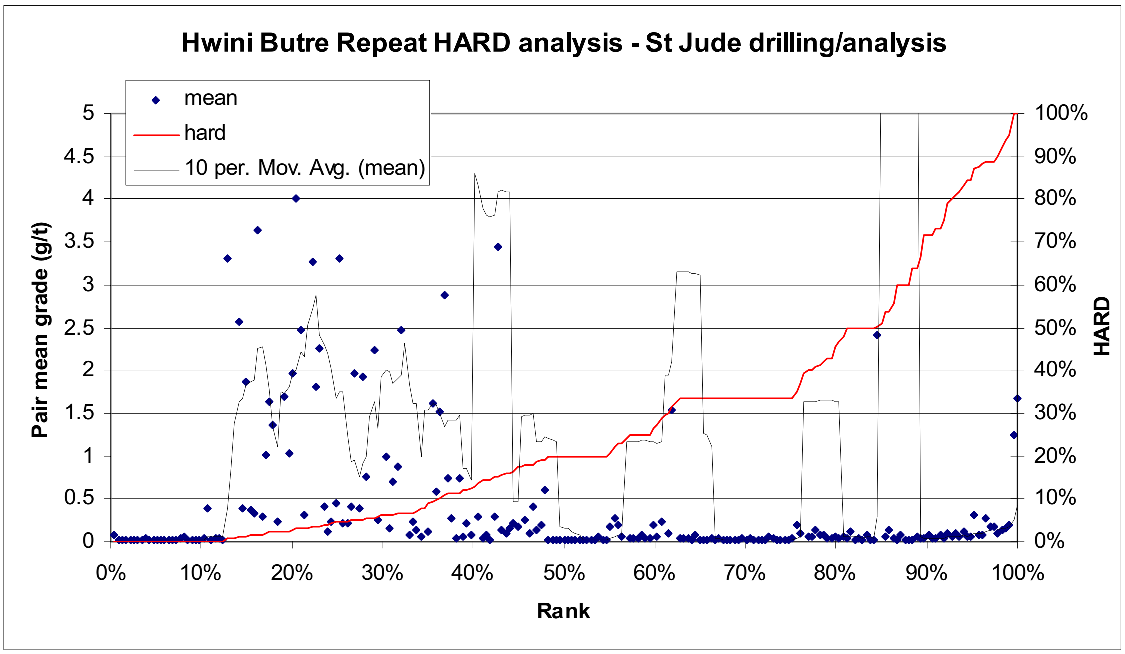


Figure 11-15: HARD plot: Repeat analysis by SJR of Hwini-Butre sample pulps

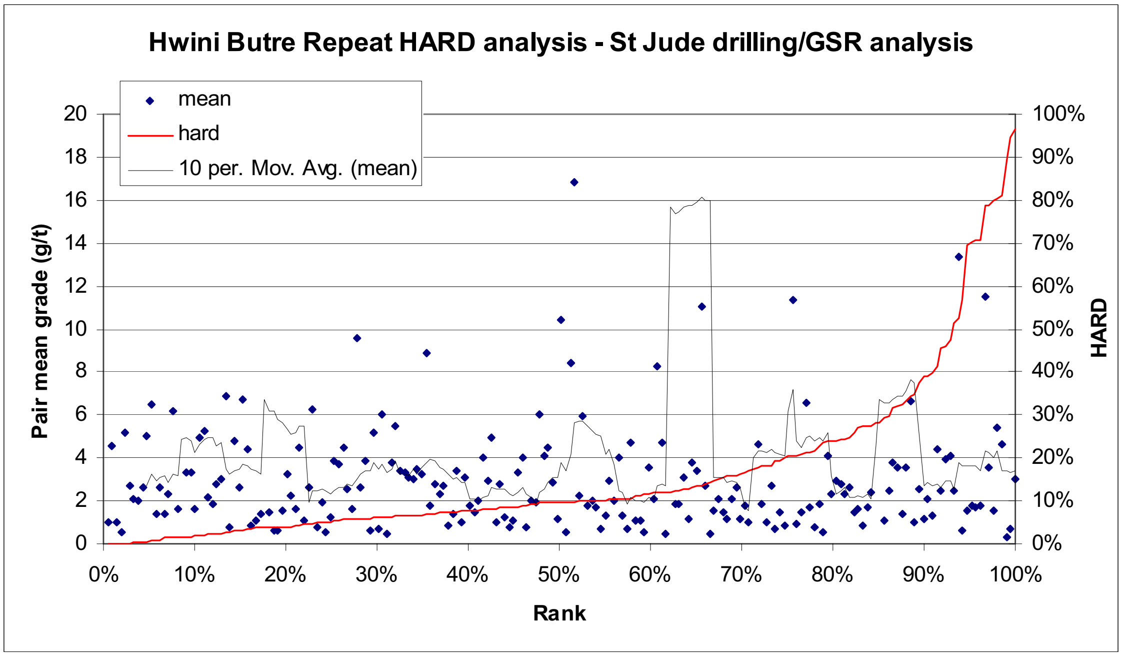


Figure 11-16: HARD plot: Repeat analysis by GSR of original SJR Hwini-Butre sample pulps

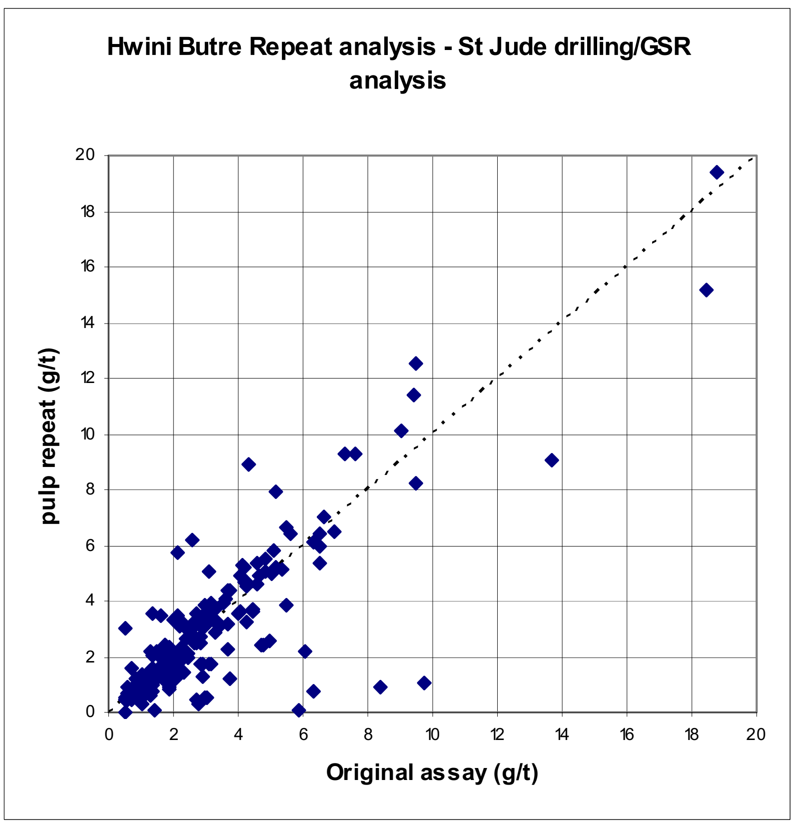


Figure 11-17: Correlation: Repeat analysis by GSR of original SJR Hwini-Butre sample pulps

11.4 BLANKS

The following plot (Figure 11-18) shows the results of assay of blanks submitted to TWL by GSR as part of their 2006 exploration campaign (Benso and Hwini-Butre combined). Some 16% of the samples returned values with grades above the detection limit with an average grade of 0.13g/t. This is heavily influenced by the results obtained during the period from 16-30th August 2006 when a significant number of blanks returned grades of up to 0.1g/t indicating an issue with either contamination or mislabeling in the laboratory.

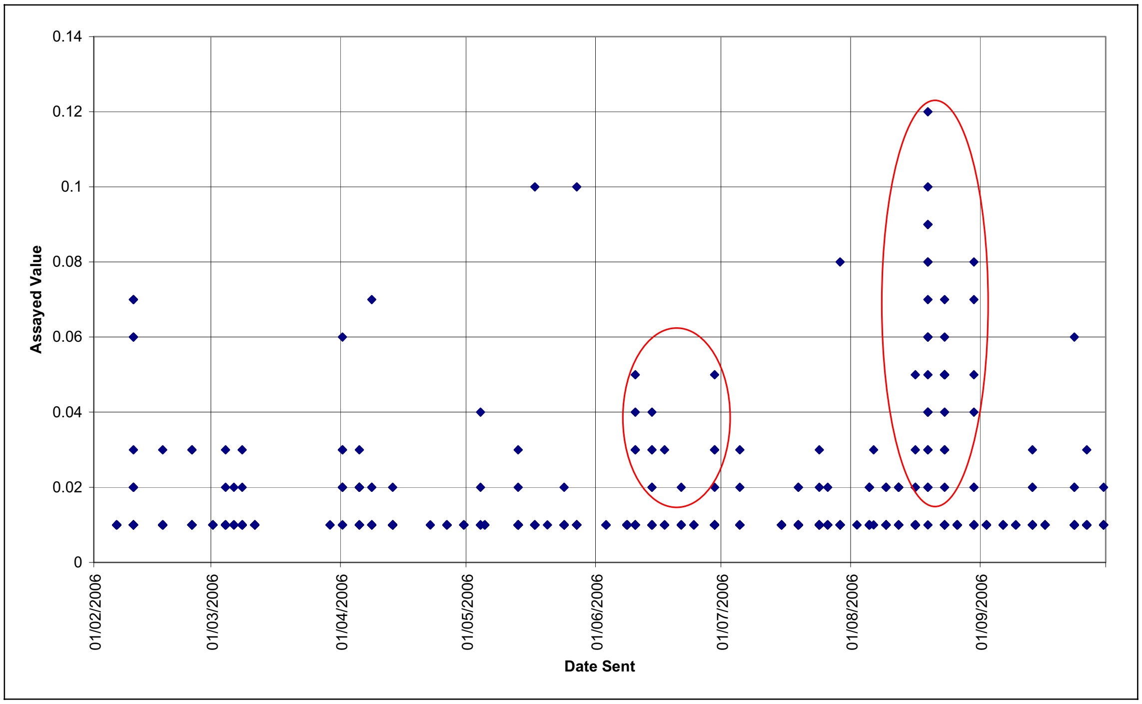


Figure 11-18: Results from assay of Blanks submitted by GSR to TWL as part of the GSR exploration programme at Benso and Hwini-Butre, January-October 2006.

11.5 STANDARDS

The following plots show the results of assays of international standard samples submitted to SGS and TWL by both SJR and GSR. The chart annotation indicates the standard designation and its value and also shows a linear best fit line through the results and the expected 99% confidence interval for the best fit line.

The SJR standards were provided by RockLabs of Auckland New Zealand which is a certified laboratory for provision of standard samples for gold assay.

The Benso results from the SJR drilling are represented by only a small number of assays (<30) and only three standards were used all of which are made up of oxide material (Figure 11-19). The limited results do not indicate any significant issues although the higher grade standard (OXK-18) appears to be generally underestimated by SGS. The limited number of only nine samples does not constitute a statistically valid sample population.

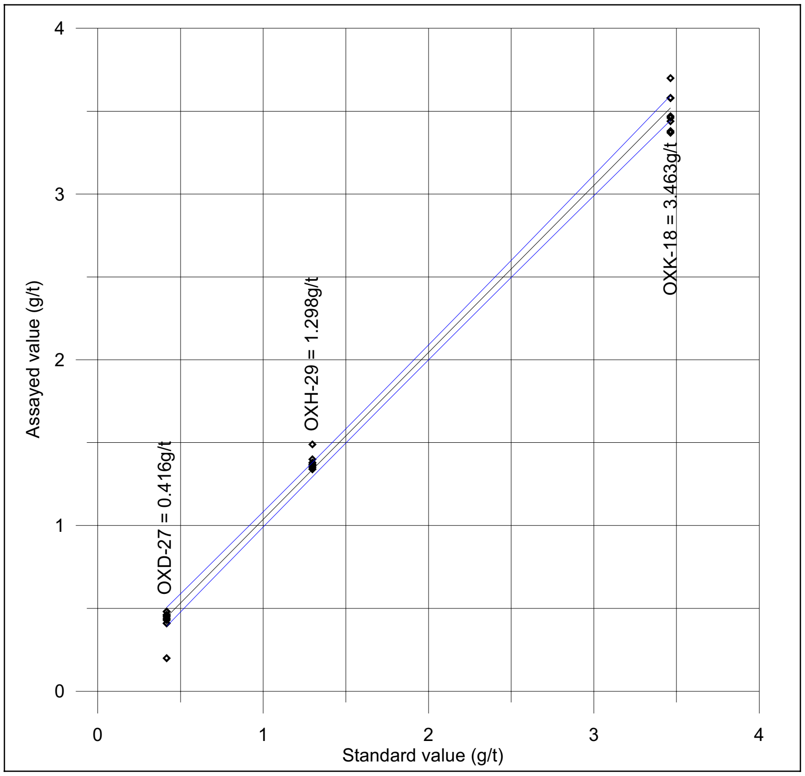


Figure 11-19: Benso standard analysis results submitted by SJR (no date information available)

The following plot (Figure 11-20) shows the results of the assay of standards submitted by SJR as part of the sampling of the Hwini-Butre deposit. A total of 100 samples were submitted with 64 standards representing sulphide material and the remainder oxide material. The lower grade standards (<2.5g/t) show a good correlation with only a minor (+/-5%) spread of values from the expected value. The higher grade standards (3.5g/t and 8.4g/t) show a much greater spread of results from that expected with a slight bias towards underestimation.

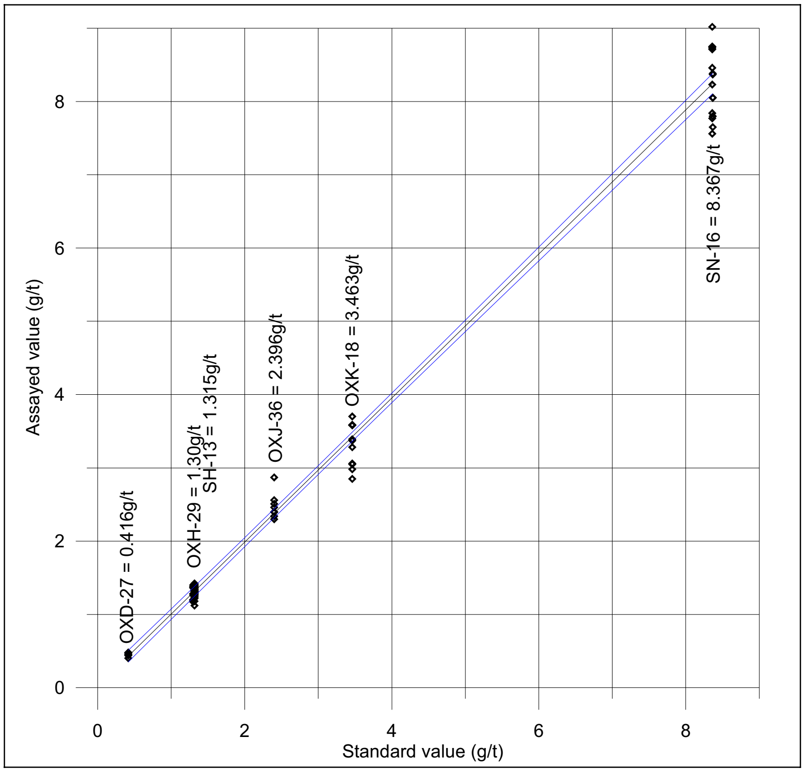


Figure 11-20: Hwini-Butre standard analysis submitted by SJR (no date information available)

GSR submitted a selection of Gannet standards as part of their sampling protocol included in each batch of samples sent to TWL during the 2006 drilling campaign. The results are summarized in the following plot (Figure 11-21) and show a clear trend for a large spread of results from the expected value (dashed line), particularly for the higher grade samples (>2g/t). The standards for grades <2g/t indicate a good correlation with the expected value with good precision. However, the higher grade standards exhibit a much wider spread of results and generally show underestimation of the standards. The exception is standard ST5355 (2.37g/t) which exhibit's almost exclusively an overestimation of the sample compared to the recorded standard value.

It is also clear that a number of standards have either been mislabeled or misreported by GSR staff and these are highlighted by the numerous outliers on the chart which are labeled as a particular standard but clearly correspond to the expected grade of a different standard.

SRK consider the standards used by GSR should be checked for suitability and possible contamination or mislabeling. If these standards have been produced internally by GSR they should be thoroughly verified by being certified by independent laboratories. Alternatively GSR should consider switching to using commercial certified standards.

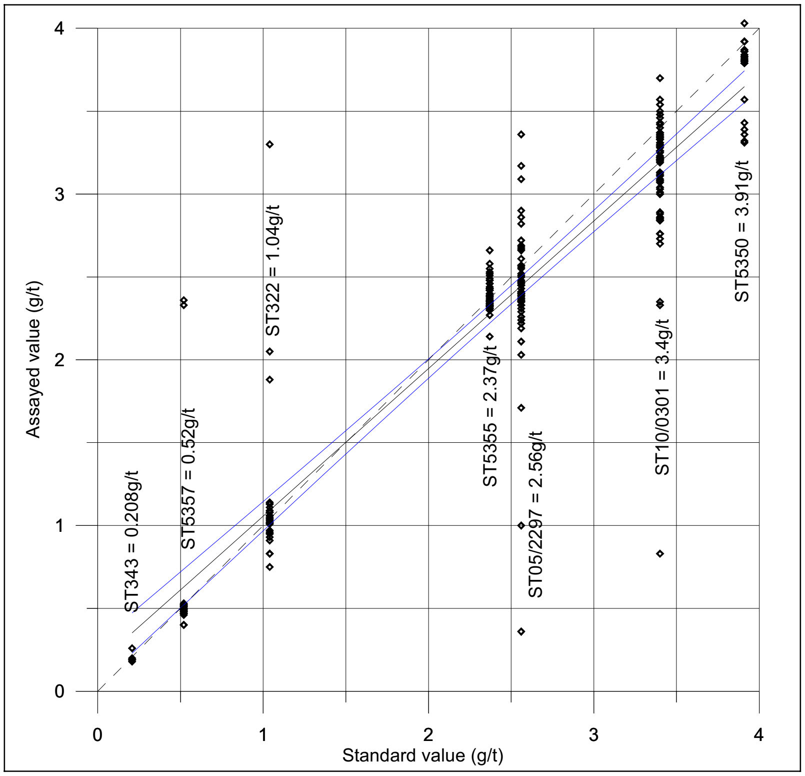


Figure 11-21: Results from assay of Standards submitted by GSR to TWL as part of the GSR exploration program at Benso and Hwini-Butre, January-October 2006

11.6 CONCLUSION

The results generally confirm the quality of the drilling and sampling and are indicating the relatively low variability of grade within the orebodies at both Benso and Hwini-Butre. However a number of issues are noted:

- The apparent underestimation of grades by SGS during the assay of samples submitted by SJR during the period prior to the takeover by GSR;
- Possible contamination of blanks submitted as part of the GSR sampling to TWL during August 2006;
- The inclusion of abundant low grade samples is skewing the HARD results obtained from the SJR pulp repeat analysis;
- The Hwini-Butre results indicate the gold distribution in this deposit may be more variable than at Benso;
- There appears to be a clear break in the variance of the data populations at approximately 4g/t in both deposits with a noted drop in precision in duplicate and repeat sampling results above this value;
- The results from assay of the various standards is indicating that the higher grade standards are not being well represented by the current assay process and GSR should investigate the quality of the standards they are using during their assay procedure;

- The previous two bullet points may be indicating a laboratory related issue either with the current assay method being unsuitable for higher grade samples possibly due to the presence of coarser gold in higher grade samples and the possible provenance of these samples from a different mineralogical domain compared to the lower grade samples. However, this would not explain the issues with poor representation of the standards assays.

12.0 ADJACENT PROPERTIES AND EXPLORATION POTENTIAL

Significant exploration potential exists on the concessions and further work is planned. This work includes further drill investigations of Inferred Mineral Resources and other targets and anomalies identified on the concessions.

The Benso-Subriso property is located some 40km (straight-line) southwest of GSR's gold mine at Wassa and about 17km (straight-line) southeast of Tarkwa, where Gold Fields Limited and Anglogold Ashanti Limited operate gold mines.

A cluster of properties, owned by GSR, surround the HBB properties. Two blocks, totaling $59km^2$, covered by the Esuaso prospecting license, are located west and southwest of the Benso property. Located about 14km northeast and 3km southeast, respectively, from the latter are the Chichiwilli and Amantin concessions, which together cover $22.5km^2$ of prospective ground. The Amantin concession and part of the Manso 1 concession share the northern boundary of the Hwini-Butre property. The two Manso concessions, Manso 1 and 2 add up to an area of over $162km^2$, share common boundaries with the Hwini-Butre property to the east, south and, partially, to the west. Adjoining the Manso 1 concession to the east is the $1,282km^2$ Takoradi north concession that extends along the coast to Cape Coast and elsewhere to the north. (Refer Figure 5-3)

Grassroots exploration has led to the delineation of soil anomalies on most of these adjacent properties. These anomalies will be the target of more advanced exploration during the next couple of years.

Significant exploration potential exists on the concessions and further work is planned. This work includes further drill investigations of Inferred Mineral Resources and other targets and anomalies identified on the concessions.

12.1 BENSO AND AMANTIN

Exploration on the Benso-Subriso concession during 2006 focused on testing the full potential of the property with extensive soil and deep auger surveys, and covered the entire concession on a 200m by 50m spacing. Anomalies generated by the soil sampling campaigns were tested further with RAB drilling. The 2007 exploration program will continue with RC follow up of the targets generated by the RAB drilling. A total of 5,000m of RC and 300m of DD drilling is planned.

At Amantin soil augering results returned late in 2006 have delineated several anomalies which will require follow-up in 2007. This will involve deep auger on a 200m by 50m grid, 1,500m of RAB drilling and 2,500m of RC with 250m of diamond tails if required.

12.2 HWINI-BUTRE

Drilling activities during 2006 concentrated on the Father Brown, Adoikrom and Dabokrom prospects in the southern portion of the concession. The objectives of these programs were to test the strike extension of the known zones of mineralization and to test the higher grade Father Brown zone down-dip to determine whether it has potential for underground exploitation. The programs were successful in delineating an extension of the Adoikrom zone to the south and the down-dip extension of the Father Brown zone.

The 2007 exploration programs for Hwini-Butre again include drilling to investigate additional targets at Father Brown, Adoikrom and Dabokrom. However the main focus of the 2007 programs will be to test the northern portion of the concession where several colonial gold occurrences (Breminsu, Apotunso, Abada, Whinnie and Guadium) are located. Soil sampling conducted by the previous concession holder has identified several anomalies (>200ppb) which require deep auger followed by RAB drilling if justified.

The proposed 2007 exploration programs involve:

- Shallow soil auger sampling to cover the existing gap ("central portion") in the soil geochemistry. A total of 40km of line cutting and 736 sample sites, starting on a 400m by 50m grid and closing to 200m by 50m over anomalous areas is contemplated;
- Deep auger will be used to constrain the existing and new soil anomalies generating RAB drilling targets. A total of 75km of line cutting and 2,000 sampling sites on a 200m by 50m grid spacing is proposed;
- RAB drilling has been planned to test strike extensions along known mineralized trends and targets generated by deep auger. A total of 10,800m of RAB drilling is proposed on an initial grid spacing of 200m by 50m with infill on a 100m by 25m centers are warranted; and
- RC and DD is planned to test the strike extension of the Abada Zone towards the Guadium Zone and follow up on targets generated by RAB drilling programs. Oriented core will assist in defining the geometry of mineralized zones. A total of 9,000m of RC and 900m of DD have been planned.

12.3 MANSO (PACIFIC MINING)

GSR has recently acquired a prospecting concession at Manso (139km^2) just to the east and south of Benso. GSR also acquired an interest in two adjacent prospecting licenses the Pacific Mining concession (23.4km^2), which is located close to the town of Manso and the Kobra Mining concession (58.7km^2 in two separate blocks) at Esuaso, adjacent to the Subriso block.

Initial 800m by 50m spaced soil sampling over the Manso license was completed in 2006 with several anomalous zones (>100ppb) being identified. The 2007 soil programs have been designed to follow up on these initial anomalies by first bringing the line spacing to 400m and if the anomaly holds together reducing this spacing to 200m. The programs will involve 108km of line cutting and 1,900 sample sites. Targets generated by deep auger will be tested further with the RAB drill and RC drilling if warranted. A total of 10,800 RAB meters and 3,000 RC meters have been budgeted.

Further follow up augering on the Pacific concession has been budgeted for 2007 and will involve infill soil sampling on a 400m by 50m grid, in-filled to 200m by 50m where warranted. This will involve 111km of line cutting and 2,147 sample sites.

12.4 CHICHIWILLI

Since acquiring Chichiwilli as part of the SJR acquisition there has been extensive geochemical sampling. This has identified anomalies that require infill sampling by RAB drilling totaling 9,600m. Another area of interest within the Chichiwilli concession is an area extensively being worked by galamsey. This area will be the focus of 3,600m of RC drilling to assess the grade continuity and strike and dip extent of the high grade structure being mined by the galamsey. The proposed haulroad for the HBB ore haulage passes through this concession area and provides an excellent opportunity for the ore to be transported to the Wassa processing plant without significant infrastructure requirements.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 METALLURGICAL TESTWORK AND MINERALOGY

John MacIntyre & Associates Limited (JMA) was appointed by GSR to complete a comprehensive metallurgical testwork program on samples of HBB ore. All laboratory testwork was conducted by AMMTEC. The following results have been extracted from JMA's *Hwini-Butre and Benso Metallurgy Report (Revision 3),* April 2007.

13.1.1 SAMPLES

Two types of sample were supplied:

1) Quarter HQ Diamond Drill Core (63.5mm diameter). 714m of this drill core that was obtained from 68 DD holes was used to form ten variability samples. These ten variability samples were used for both physical testwork and cyanide leach testwork.
2) PQ Diamond Drill Core (82mm diameter). 73m of this drill core was used to form five composite samples.

The PQ drill core used to from the two Subriso composite samples and the one Father Brown composite sample had a sliver cut off it for assaying purposes. The sliver represented approximately 15% of the drill core.

The PQ drill core that was used to form the two Adoikrom composite samples was supplied as half PQ core.

These five PQ core samples were used for physical testwork only.

13.1.2 SPATIAL REPRESENTATION OF THE HQ DD CORE SAMPLES

Table 13-1 summarizes the spatial representation of the 69 HBB HQ DD core intervals from which the ten variability samples were formed.

The following points are noted:

1) Sample Size Representation. Variability samples were formed on the basis that each sample should represent approximately 50,000oz of Mineral Reserve. Ten variability samples were formed representing a total of 634,000oz of Mineral Reserve.
2) Depth Representation. The variability samples were formed on a depth basis to meet the 50,000oz sample size criteria.
3) Lateral Representation. 68 DD holes (and 69 intervals) were used to form the ten variability samples. That is each sample was derived on average from seven DD holes.
4) Mining Width Representation. A total of 714m of DD core was used to form the ten variability samples. The average interval length is 10.4m based on there being a total of 69 intervals. The average interval length varies from 6.9m for the Father Brown deposit to 12.5m for the Subriso East deposit. Appropriate allowances were made for both internal and external dilution so as to represent the as mined material.
5) Grade Representation. The grade of the Subriso East, Subriso West and Adoikrom samples is in close agreement with their Mineral Reserve grades. Although the grade of

the individual Father Brown samples is somewhat erratic, the mean sample grade of 5.66g/t is marginally higher than the Mineral Reserve grade of 5.27g/t.

6) Global Representation. The testwork samples represent on average 81% of the Mineral Reserve on a depth basis.

All of these factors indicate that the ten variability samples represent their Mineral Reserve very well.

Table 13-1: Summary of the Spatial Representation of the HQ DD Core Samples

Sample ID	Reserve Tonnes tonnes	Reserve Grade g/t	Reserve Contained Au ounces	Testwork Samples Acual Interval	Mean RL metres	No of Drill Holes	Interval metres	Tonnes tonnes	Drill Core Wt Grade	Contained Au ounces	Proportion of Ounces
SUBRISO EAST											
90-0 m RL	541,245	4.48	77,893	66-18 m RL	37	9	87	429,297	4.37	60,336	77%
SUBRISO WEST											
90-57 m RL	329,638	3.64	38,568	90-57 m RL	69	9	127	329,638	3.63	38,421	100%
57-(50) m RL	312,859	4.66	46,872	57-(50) m RL	19	10	110	312,859	4.76	47,887	102%
Mean	642,497	4.14	85,440	90-(50) m RL	45	19	237	642,497	4.15	86,309	101%
ADOIKROM											
190-150 m RL	429,966	5.65	78,090	192-154 m RL	174	6	82	429,966	5.74	79,310	102%
150-110 m RL	381,857	4.57	56,057	150-115 m RL	132	4	59	336,840	4.10	44,427	79%
110-0 m RL	748,110	2.94	70,644	110-51 m RL	87	11	112	460,037	2.91	43,112	61%
Mean	1,559,933	4.08	204,791	192-51 m RL	130	21	253	1,226,843	4.11	166,850	81%
FATHER BROWN											
190-130 m RL	469,511	4.11	61,985	160-143 m RL	150	3	23	260,908	6.31	52,966	85%
130-110 m RL	349,906	5.11	57,477	141-114 m RL	124	5	37	349,906	4.01	45,142	79%
110-70 m RL	373,543	5.93	71,243	110-80 m RL	95	7	50	293,545	7.16	67,560	95%
70-0 m RL	375,472	6.23	75,252	62-26 m RL	51	4	27	220,943	4.60	32,702	43%
Mean	1,568,431	5.27	265,956	160-26 m RL	108	19	137	1,125,302	5.66	198,370	75%
ALL DEPOSITS											
Mean	4,312,106	4.57	634,081		95	68	714	3,423,939	4.65	511,865	81%

13.1.3 SPATIAL REPRESENTATION OF THE PQ DD CORE SAMPLES

The five PQ DD core variability samples are not spatially representative of the Mineral Reserve. They consist of 86m of drill core ore representing four gold bearing intervals and one barren interval. Globally they represent 9% of the HBB Mineral Reserve on a depth basis. The Subriso East sample represents 5% of its Mineral Reserve on a depth basis. The Subriso West sample represents 4% of its Mineral Reserve on a depth basis. The two Adoikrom samples represent 24% of their Mineral Reserve on a depth basis. The Father Brown sample represents 0% of its Mineral Reserve on a depth basis. The 13m of Father Brown drill core contain an average gold grade of only 0.04g/t.

13.2 PHYSICAL CHARACTERISTICS

13.2.1 UCS, WORK INDEX, ABRASION INDEX AND SPECIFIC GRAVITY VALUES

Table 13-2 summarizes the unconfined compressive strength ("UCS"), rod mill work index, ball work index, abrasion index and specific gravity values adopted for each of the ten variability samples.

Table 13-2: HBB - Physical Characteristics Adopted

Deposit	UCS Mpa	Work Index Values Crushing kWh/t	Rod Mill kWh/t	Ball Mill kWh/t	Rod: Ball Ratio	Abrasion Index	Specific Gravity t/m3
SUBRISO EAST							
90-0 m RL	62	11.2	21.1	13.7	1.54	0.16	2.76
SUBRISO WEST							
90-57 m RL	22	8.9	16.0	11.7	1.37	0.22	2.87
57-(50) m RL	22	8.9	18.8	14.1	1.33	0.28	2.81
Mean	22	8.9	17.3	12.8	1.35	0.25	2.84
ADOIKROM							
190-150 m RL	95	9.5	16.8	11.3	1.49	0.21	2.77
150-110 m RL	95	9.5	17.3	11.8	1.47	0.33	2.73
110-0 m RL	95	9.5	18.2	12.6	1.44	0.38	2.71
Mean	95	9.5	17.5	11.9	1.46	0.31	2.74
FATHER BROWN							
190-130 m RL	235	19.1	18.4	13.5	1.36	0.25	2.72
130-110 m RL	235	19.1	18.9	14.4	1.31	0.18	2.73
110-70 m RL	235	19.1	19.0	14.5	1.31	0.22	2.74
70-0 m RL	235	19.1	20.3	15.7	1.29	0.16	2.81
Mean	235	19.1	19.1	14.5	1.32	0.20	2.75

The following points are noted:

1) Subriso and Adoikrom UCS and Crushing Work Index Values. The Subriso and Adoikrom UCS and crushing work index values are all low or below average.
2) Father Brown UCS and Crushing Work Index Values. The Father Brown UCS and crushing work index values are both high to very high. The Father Brown PQ DD core interval used for this testwork did not contain any gold.
3) Rod Mill Work Index Values. All rod mill work index values are high to very high.
4) Ball Mill Work Index Values. All ball mill work index values are either slightly above average or slightly below average.
5) Rod: Ball Mill Work Index Ratios. All rod/ball mill work index values are high to very high, indicating that critical size build up within the mill may be a problem.
6) Abrasion Index. All abrasion index values are average or below average.
7) Specific Gravity Values. The specific gravity values vary from 2.71t/m^3. to 2.87t/m^3. They are not dependant on the sulphide sulphur head grade or depth.

13.2.2 VISCOSITY

Viscosity measurements were undertaken on the leach residues from each of the ten variability samples. All values were consistently low and independent of depth.

13.2.3 OXYGEN CONSUMPTION

Oxygen uptake tests were conducted on the Subriso West, Adoikrom and Father Brown Knelson tail composite samples. All measured oxygen uptake consumptions are very low, being 0.017mg/L/minute for Subriso West, 0.014mg/L/minute for Adoikrom and 0.023mg/L/minute for Father Brown. JMA has averaged all test results to derive these values.

The plant oxygen consumptions have been estimated as 2.0tpd for Subriso West, 1.7tpd for Adoikrom and 2.7tpd for Father Brown at one Atmosphere pressure and 0ºC. The Wassa plant has two 2.1tpd oxygen plants. That is, the existing Wassa oxygen output should be sufficient for the HBB ore.

13.2.4 CARBON ACTIVITY

Fleming k and n carbon activity values were measured for the Subriso West, Adoikrom and Father Brown Knelson tail composite samples using a sample of Wassa's new Chemquest activated coconut carbon. The following values in Table 13-3 were recorded:

Table 13-3: HBB - Fleming Values

Deposit	Fleming Values	
	k	n
Subriso West	342	0.59
Adoikrom	256	0.62
Father Brown	240	0.62

All Fleming k and n carbon activity are typical of a high activity carbon in contact with a low fouling ore.

13.2.5 THICKENING TESTWORK

Outokumpu, (Perth) conducted thickening testwork on a HBB master composite leach residue sample. That sample consisted of equal portions of each of the ten variability samples. A thickener underflow density of 61.3% is inferred for a flux rate of 1t/m^2/hour when a scale up factor of 2.5% density is applied.

A 24m diameter thickener would be required to thicken 432tph of Adoikrom, 190RL to 150RL material at a flux rate of 1.0t/m^2/hour. This is the maximum HBB campaign milling rate through both mills. The thickener diameter would rise to 26m for thickening 502tph of CIP residue, being the present Wassa ore milling rate.

13.3 HEAD ASSAYS, DIAGNOSTIC LEACH AND MINERALOGY

13.3.1 HEAD ASSAY

Full scan head assays were conducted on each of the ten variability samples. Table 13-4 summarizes the key average values measured for each deposit:

Table 13-4: HBB - Average Head Grades

Element	Subriso	Adoikrom	Father Brown
Gold	4.56g/t	3.52g/t	8.09g/t
Silver	< 2ppm	< 2ppm	< 2ppm
Sulphide Sulphur	1.08%	1.28%	0.93%
Sulphate Sulphur	0.06%	0.05%	0.02%
Sulphur Oxidation	7%	4%	2%
Arsenic	13ppm	97ppm	27ppm
Organic Carbon	0.06%	<0.03%	<0.03%

The following points are noted:

1) Sulphide Sulphur Grades and Sulphur Oxidation. All deposits have a sulphide sulphur grade that varies between 0.91% to 1.28%. The Subriso East deposit has the highest level of sulphur oxidation of 15% that would put it into the transition-fresh category. All other nine variability samples can be regarded as being fresh or primary samples.
2) Arsenic. All arsenic grades are low indicating that the refractory gold component should be low. The Adoikrom deposit contains the highest average arsenic concentration of 97ppm.
3) Organic Carbon. The organic carbon grade of nine of the ten variability samples is below the detection limit of 0.03%. The Subriso East variability sample has an organic carbon grade of 0.09% indicating that this sample has the ability to be preg robbing.

13.3.2 DIAGNOSTIC LEACH

Diagnostic leach tests were conducted on each of the ten variability samples at a P_{80} grind size of 75µm. Table 13-5 summarizes the average new carbon values measured for each deposit:

Table 13-5: HBB - Diagnostic Leach Results

Category	Subriso	Adoikrom	Father Brown
CIL Recoverable Gold	94.3%	85.5%	95.6%
Carbonaceous Gold	2.2%	1.2%	0.7%
Sulphide Gold	2.7%	12.8%	3.5%
Silicate Gold	0.8%	0.5%	0.2%
Total Gold	100.0%	100.0%	100.0%

The following points are noted:

1) CIL Recoverable Gold. The Adoikrom deposit contains the least amount of CIL recoverable gold, being 85.5%. Both the Subriso and Father Brown deposits contain high amounts of CIL recoverable gold in excess of 94%.
2) Carbonaceous Gold. The only deposit that shows any signs of preg robbing is the Subriso deposit, or more specifically the Subriso East, 90RL to 0RL sample. An average of 3.4% of that sample's gold was measured to be preg robbed using new carbon. An average of 3.2% of that sample's gold was calculated to be preg robbed using loaded carbon. All other values are detection limit measurements.
3) Sulphide Gold. An average of 12.8% of the Adoikrom gold is sulphide gold. This is an appreciable amount. This could be present as either particulate or refractory gold or a combination of the two. There is a strong correlation between the amount of sulphide gold and the sulphide sulphur head grade and the arsenic head grade. This is particularly true for the Adoikrom and Father Brown deposits.
4) Silicate Gold. All values are extremely low, indicating the previous diagnostic leach stages have been successful in accounting for the preg-robbed gold and the sulphide gold.

13.3.3 MINERALOGY

Table 13-6 summarizes the observed particulate gold occurrences and their association.

Table 13-6: HBB - Mineralogy Summary

ID	Deposit	Interval (m RL)		Gold Occurrence			
		From	To	Liberated	Pyrite	Gangue	Total
1. Subriso							
3.1.1	Subriso East	90	-	-	4	-	4
3.1.2	Subriso West	90	57	-	1	-	1
3.1.3	Subriso West	57	(50)	-	4	-	4
			Total	-	9	-	9
				0%	100%	0%	100%
2. Adoikrom							
4.1.2	Adoikrom	190	150	-	7	-	7
4.1.1	Adoikrom	150	110	-	8	1	9
4.1.3	Adoikrom	110	-	1	6	-	7
			Total	1	21	1	23
				4%	91%	4%	100%
3. Father Brown							
5.1.1	Father Brown	190	130	-	7	-	7
5.1.2	Father Brown	130	110	2	6	-	8
5.1.3	Father Brown	110	70	1	1	2	4
5.1.4	Father Brown	70	-	-	3	2	5
			Total	3	17	4	24
				13%	71%	17%	100%
4. Total							
			Total	4	47	5	56
				7%	84%	9%	100%

The following points are noted:

1) Pyrite Hosted Particulate Gold. The majority of the observed particulate gold occurrences; that is an average of 84% are associated with pyrite. This is especially true of the Subriso and Adoikrom deposits where 100% and 91% of the total particulate gold occurrences are hosted by pyrite.
2) Arsenic Hosted Particulate Gold. 13% of the Father Brown deposit's particulate gold occurrences are hosted by arsenopyrite. The Subriso deposit contains no particulate gold hosted by arsenopyrite, whereas the Adoikrom deposit contains 4% of its total particulate gold occurrences associated with arsenopyrite.
3) Gangue Hosted Particulate Gold. 17% of the Father Brown deposit's particulate gold occurrences are hosted by gangue. The Subriso deposit contains no particulate gold hosted by gangue, whereas the Adoikrom deposit contains 4% of its total particulate gold occurrences associated with gangue.

13.3.4 SULPHIDE GOLD FORM

Samples of each of the three Knelson tail composite samples were direct cyanide leached at a target P_{80} grind size of 75µm. The leach residues were then floated to produce a sulphide concentrate. Each of the three sulphide concentrates were finely ground to a target P_{80} of five microns before being CIL treated for 48 hours. The amount of gold recovered from the each sulphide concentrate is an indication of how much of the sulphide gold is particulate gold. The residual sulphide concentrate gold would be a combination of both particulate gold and solid solution refractory gold. The following CIL recoveries in Table 13-7 were measured for the sulphide concentrates:

Table 13-7: HBB - Laboratory CIL Recoveries

Deposit	As Head Grade	Conc. CIL Rec. Gold
Subriso West:	15ppm	90.7%
Adoikrom:	88ppm	74.7%
Father Brown:	28ppm	85.4%

CIL recovery decreases as the arsenic head grade increases. That is, there is a higher proportion of cyanide soluble particulate sulphide gold associated with the lower arsenic grade samples than the higher grade arsenic grade samples. Nonetheless all CIL recoveries are in excess of 74%, indicating that the majority of sulphide gold present is particulate gold rather than solid solution refractory gold.

13.4 CYANIDE LEACHING

13.4.1 INITIAL DIRECT LEACH TESTS AND PREG ROBBING CHARACTERISTICS

Direct leach tests were initially conducted on the Knelson tail fraction of the ten Subriso, Adoikrom and Father Brown variability samples. The purpose of this initial direct leach testwork was to ascertain whether subsequent tests should be conducted as direct leach tests or as CIL tests.

The Subriso East, 90RL to 0RL variability sample was the only sample identified as being mildly preg-robbing. The recovery plateaus off after five hours indicating that the organic carbon is preg-robbing any additional gold that is leached. If an ore is not preg robbing, then it shouldn't stop leaching. Recovery should steadily increase with time.

All subsequent cyanidation tests were conducted as CIL tests for the Subriso East, 90RL to 0RL variability sample. All subsequent cyanidation tests for the nine other variability samples were conducted as direct leach tests.

Mild preg-robbing was later observed to be taking place for the 0.75kg/t initial cyanide addition test that was conducted on the Adoikrom Knelson tail composite sample. Organic carbon can often be erratically distributed throughout a sample, with preg-robbing characteristics not occurring in most samples, but occasionally occurring in some samples.

13.4.2 HEAD GRADE RECONCILIATION

Very good reconciliation exists between the mean Mineral Reserve grades, drill hole grades and the estimated grind-recovery head grades for each deposit (Refer Table 13-8):

Table 13-8: HBB - Head Grade Reconciliation

Deposit	Reserve	Drill Hole	Calculated
Subriso	4.29g/t	4.28g/t	4.47g/t
Adoikrom	4.08g/t	4.20g/t	3.97g/t
Father Brown	5.27g/t	5.73g/t	5.61g/t
Weighted Mean	4.57g/t	4.78g/t	4.70g/t

13.4.3 GRAVITY GOLD

The following amounts of amalgam gravity gold were recovered for each deposit (Refer Table 13-9).

Table 13-9: HBB - Percentage Gravity Gold

Deposit	Grade	Percent
Subriso	0.57g/t	12.8%
Adoikrom	1.13g/t	28.5%
Father Brown	2.98g/t	51.3%
Weighted Mean	1.65g/t	35.1%

The amount of gravity gold recovered is strongly dependant on the gold head grade for the Adoikrom and Father Brown deposits, but not so for the Subriso deposit. Removal of an amalgamated gravity concentrate enhances the already fast leach rates quite appreciably for all deposits.

13.4.4 GRIND-RESIDUE GRADE RELATIONSHIPS

A suite of four grind-recovery tests were conducted on each of the ten variability samples. Figure 13-1 to Figure 13-3 depict the grind-48 hour residue grade relationships established for the three Subriso variability samples, the three Adoikrom variability samples and the four Father Brown variability samples.

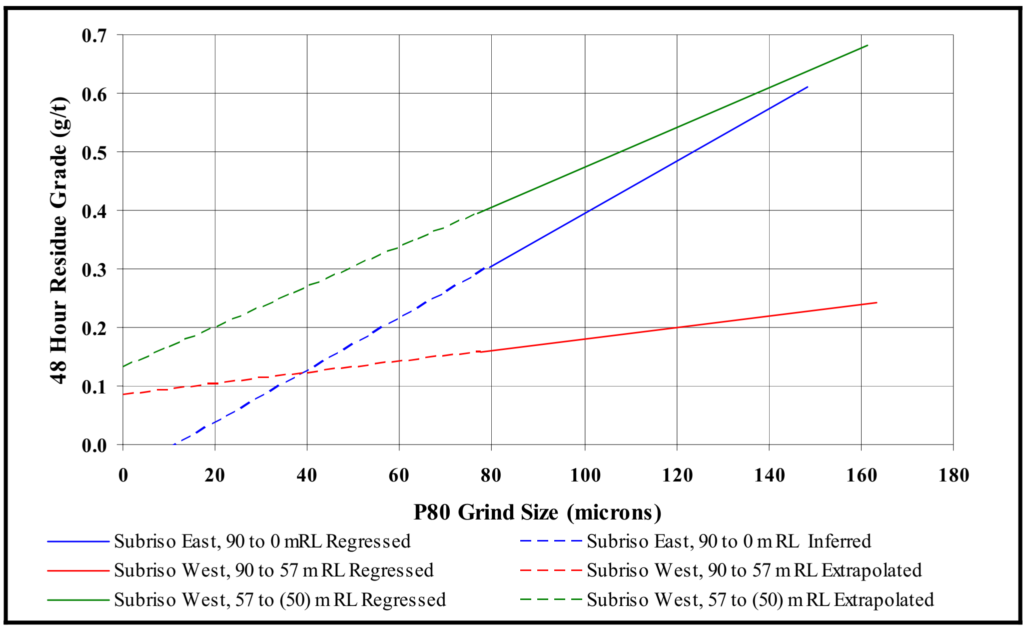


Figure 13-1: Subriso Grind-48 Hour Leach Residue Grade Relationships

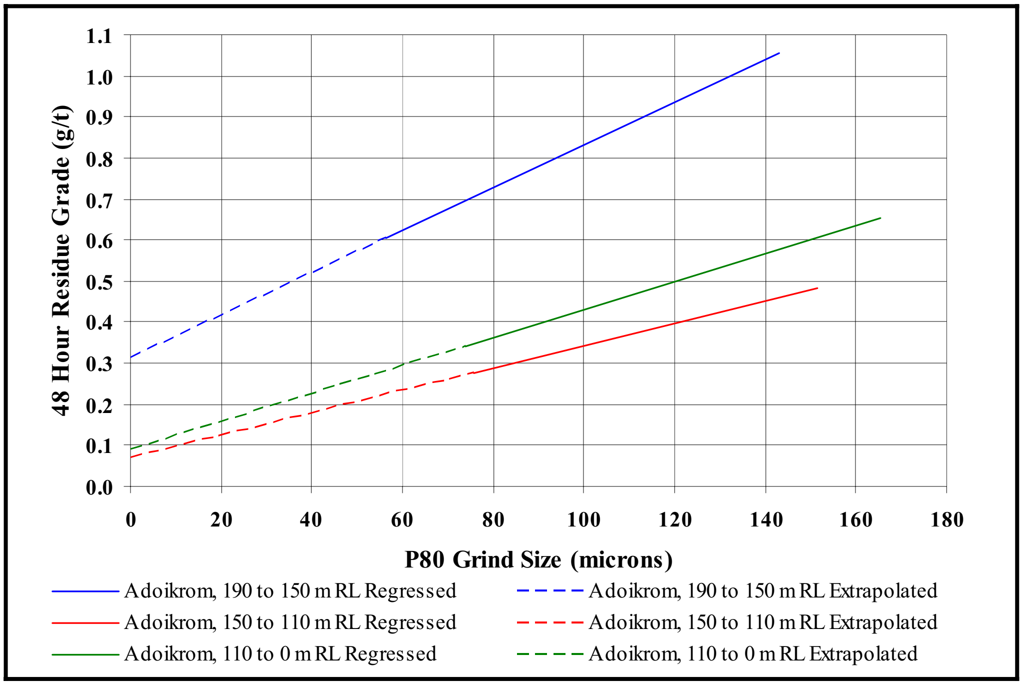


Figure 13-2 Adoikrom Grind-48 Hour Leach Residue Grade Relationships

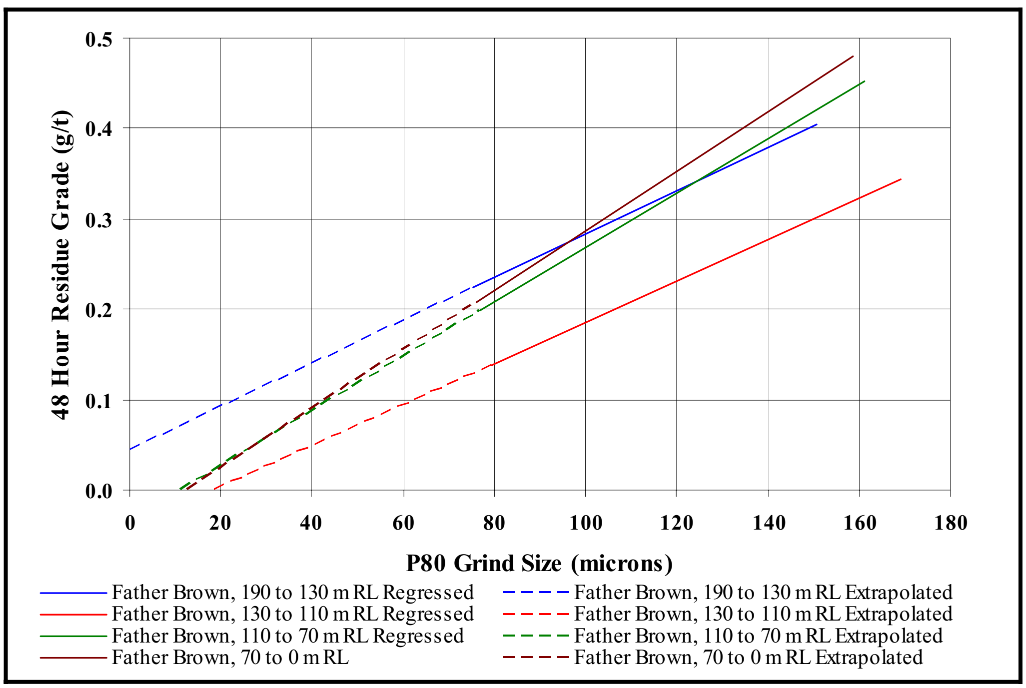


Figure 13-3: Father Brown Grind-48 Hour Leach Residue Grade Relationships

13.4.5 DISSOLVED OXYGEN CONCENTRATION

Leach Kinetics can be described by the following equation:

Leach Recovery = A + B/t

Where "A" is an indication of the absolute recovery if the ore is leached for an infinite amount of time. And "B" is the leach rate. Its value is negative if the ore isn't preg robbing. The less negative the value, the faster the rate of leaching. If the leach rate is positive or becomes less negative in the latter stages, then this denotes that the ore may be preg robbing.

The leach rate is directly dependant on the average dissolved concentration for all ore types as depicted by Figure 13-4. The leach rate of the Subriso West Knelson tail composite sample is the most dependent on the dissolved oxygen concentration. The leach rate of the Adoikrom Knelson tail composite sample is the second most dependent on the dissolved oxygen concentration. The leach rate of the Father Brown Knelson tail composite sample is the least dependent on the dissolved oxygen concentration.

The Subriso leach rate is very fast at an average dissolved oxygen concentration of 25ppm. The Adoikrom and Father Brown leach rates are both extremely fast at an average dissolved oxygen concentration of 25ppm.

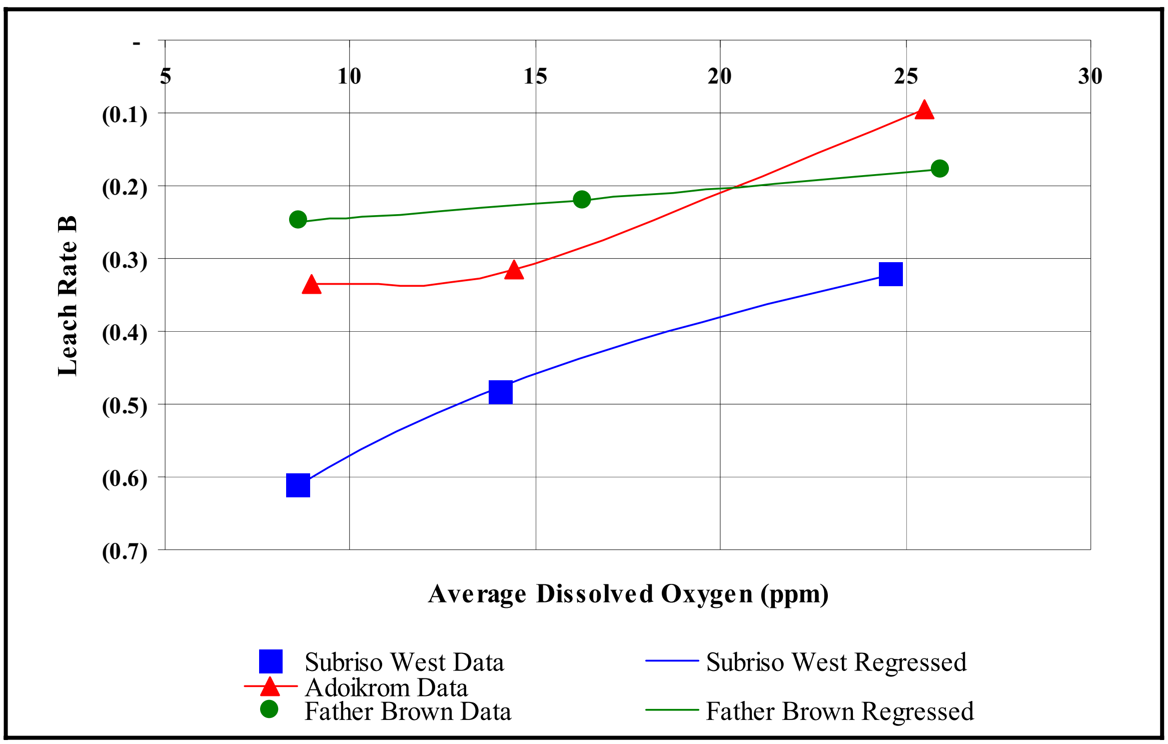


Figure 13-4: Average Dissolved Oxygen Concentration-Leach Rate Relationships

13.4.6 INITIAL CYANIDE CONCENTRATION

The leach rate is not dependent on the initial cyanide concentration over the 0.5kg/t to 1.0kg/t range.

13.5 OPTIMUM CONDITIONS

13.5.1 GRIND SIZE, RECOVERIES, MILLING RATES AND LEACH RESIDENCE TIMES

The optimum grind size has been determined for each of the ten variability samples as the grind size that produces the maximum revenue less processing cost outcome when HBB ore is:

- Campaign (or separately) milled through No. 2 mill; or
- CIL treated as a blend with Wassa ore that has been campaign milled through No. 1 mill to a P_{80} product size of 125 µm. Seven CIL tanks, being one more than the existing facility have been used for this assessment.

The optimum grind size has been determined using matrix of seven P_{80} grind sizes, spaced 15µm apart over a 60µm to 150µm range. Processing costs have been computed using a 1,700 row long computer program.

The optimum grind size has been determined to be a P_{80} of 75µm for all ten variability samples. Table 13-10 summarizes the optimum grind size, recoveries, milling rates and leach residence times.

Table 13-10: Summary of the Optimum Grind Size

Deposit	Reserve			Recovery Based on Reserve Head Grades			Grind Size	Milling Rate	Leach Res.
	Tonnes	Mean RL	Grade	Leach Residue	Gravity Au	Net Recovery	P80	TPH	Time (hours)
1. Subriso									
SE Zone, Fresh, 90 to 0 m RL	541,245	37	4.48	0.324	7.4%	92.8%	75	173	26
SW Zone, Fresh, 90 to 57 m RL	329,638	69	3.64	0.191	24.0%	94.8%	75	211	24
SW Zone, Fresh, 57 to (50) m RL	312,859	19	4.66	0.422	13.2%	90.9%	75	171	26
Weighted Mean	1,183,742	NA	4.29	0.313	13.0%	92.7%	75	181	25
2. Adoikrom									
Adoikrom, Fresh, 190 to 150 m RL	429,966	174	5.65	0.733	33.8%	86.8%	75	216	23
Adoikrom, Fresh, 150 to 110 m RL	381,857	132	4.57	0.286	29.6%	93.7%	75	207	24
Adoikrom, Fresh, 110 to 0 m RL	748,110	87	2.94	0.373	22.7%	87.3%	75	191	24
Weighted Mean	1,559,933	130	4.08	0.451	28.8%	88.9%	75	201	24
3. Father Brown									
Father Brown, Fresh, 190 to 130 m RL	469,511	150	4.11	0.251	43.2%	93.9%	75	179	25
Father Brown, Fresh, 130 to 110 m RL	349,906	124	5.11	0.163	46.2%	96.8%	75	166	26
Father Brown, Fresh, 110 to 70 m RL	373,543	95	5.93	0.219	67.5%	96.3%	75	165	26
Father Brown, Fresh, 70 to 0 m RL	375,472	51	6.23	0.239	46.4%	96.2%	75	150	27
Weighted Mean	1,568,431	108	5.27	0.221	51.3%	95.8%	75	165	26
4. All									
Weighted Mean	4,312,106	NA	4.57	0.329	34.2%	92.77%	75	181	25

The following points are noted:

1) Leach Residue Grades. The leach residue grades have been computed from the grind-48 hour residue grade relationships depicted in Section 13.4.4. Those values have been adjusted for a reduction in the leach residence time to the plant values nominated by Table 13-10 using the leach rate for each variability sample. Each leach residue grade includes a solid equivalent solution gold loss allowance of:

    - 0.0106g/t for the Subriso samples;
    - 0.0166g/t for the Adoikrom samples; and
    - 0.0168g/t for the Father Brown samples.

    The solid equivalent solution gold losses have been modeled using 60% of the Fleming carbon activity values nominated by Section 13.2.4.

2) Recommended Recoveries. The recommended recoveries for campaign milling the three HBB deposits are based on the grind-residue grade relationships (plus their soluble gold loss allowances) and their Mineral Reserve grades. (Refer Table 13-11).

    Table 13-11: HBB - Recommended Recoveries

Subriso/Benso:	92.7%
Adoikrom:	88.9%
Father Brown:	95.8%
Mean:	92.8%

    If the recommended recoveries were based on the calculated testwork head grades, then the weighted mean HBB recovery of 92.8% would increase by only 0.2% to 93.0%. If the recommended recoveries were based on the 24 hour testwork recoveries (plus the soluble gold loss for each deposit), then the weighted mean HBB recovery of 92.8% would decrease by only 0.5% to 92.3%. That is, all three methods of estimating the recommended recoveries are in excellent agreement with each other.

3) Dissolved Oxygen Concentration. A dissolved oxygen concentration of 25ppm plus is recommended. The existing two Wassa oxygen plants should be sufficient for the HBB requirements.

4) Mill Throughput Rate Depth Relationship. Figure 13-5 indicates that the mill throughput rate for campaign treatment of HBB ore through No. 2 mill only decreases as the depth increases for all deposits.

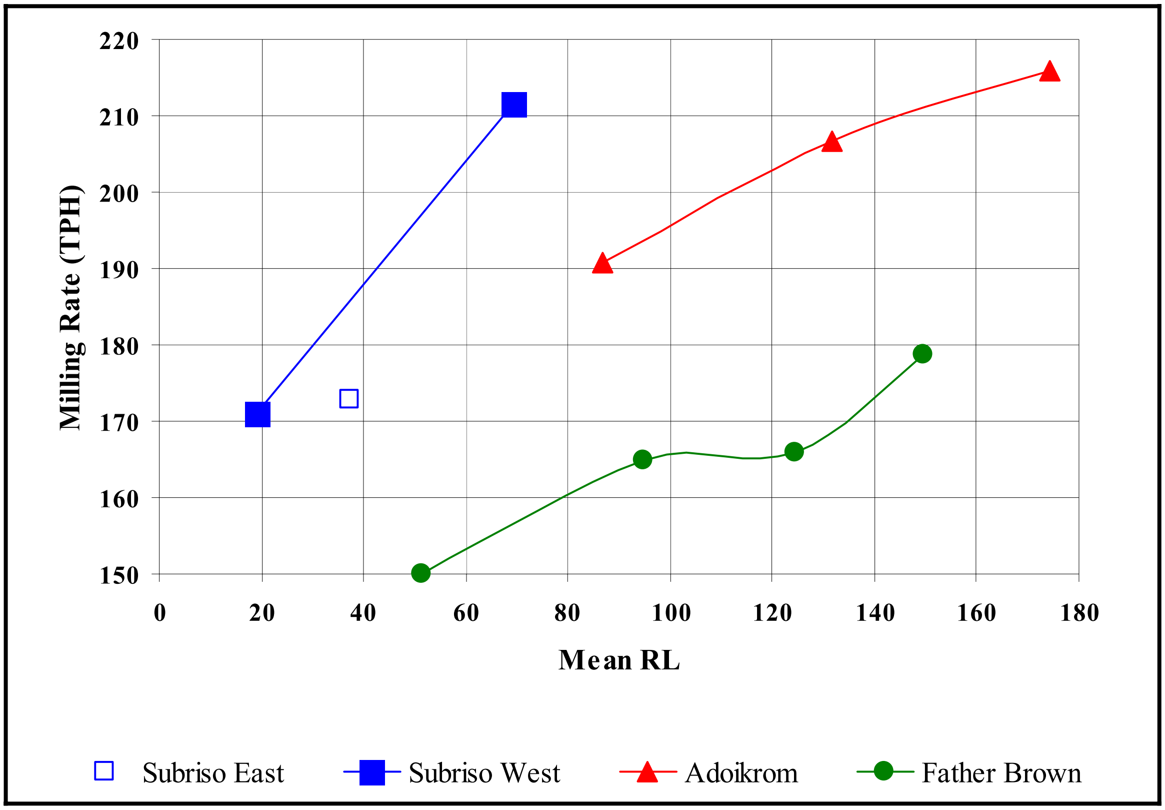


Figure 13-5: Mill Throughput Rate-Depth Relationship

5) Leach Residence Times. The leach residence times vary from 23 to 27 hours. The weighted mean residence time for campaign treatment is 25 hours.

13.5.2 LEACH RESIDENCE TIME

The optimum leach residence time has been determined for each of the Subriso West, Adoikrom and Father Brown Knelson tail composite samples as the residence time that produces the maximum revenue less processing less capital cost outcome. This has been determined for three dissolved oxygen concentrations of 8ppm, 15ppm and 25ppm using matrix of four leach residence times:

- Five leach tanks, being one tank offline;
- Six leach tanks, being the existing number of tanks;
- Seven leach tanks, being one additional leach tank; and
- Eight leach tanks, being two additional leach tanks.

Each assessment takes into account the soluble gold loss associated with each different CIL configuration and carbon activity. GSR supplied the all-up capital cost of one additional 2,500m^3 CIL tank as being $1.0M.

The optimum leach residence time assessment indicates that one additional 2,500m^3 CIL tank should be installed. The installation of one additional CIL tank enhances the revenue less capital and processing costs of the project by some:

- $358,000 for a 25ppm dissolved oxygen concentration;
- $695,000 for a 15ppm dissolved oxygen concentration; and
- $900,000 for an 8ppm dissolved oxygen concentration.

13.5.3 CYANIDE CONSUMPTION

The CIL cyanide consumptions are appreciably higher than the direct leach cyanide consumptions for all ten variability samples. The most likely reason for this is that the activated carbon has oxidized the cyanide to cyanate. Each CIL test has been conducted with an initial carbon concentration of 30g/L for the first 2.5 hours of the test, with a carbon concentration of 15g/L being used for the remainder of the test. That is the 15g/L carbon concentration for the majority of the CIL tests is almost twice the 8g/L used in the Wassa plant.

Table 13-12 compares the direct leach cyanide consumptions with the CIL cyanide consumptions for the calculated plant residence times. The residual cyanide consumption of 0.125kg/t is based on a residual cyanide concentration of 100ppm in a slurry with a 44.4% pulp density. The average of the CIL and direct leach cyanide consumptions have been in the processing cost estimates.

The weighted mean HBB plant cyanide consumption of 0.50kg/t is 0.10kg/t more than Wassa's 2007 budget cyanide consumption of 0.40kg/t.

Table 13-12: HBB - Cyanide Consumption (kg/t)

Deposit	Reserve	Leach Res.	Direct Leach			CIL			Average		
	Tonnes	Time (hours)	Test	Residual	Total	Test	Residual	Total	Test	Residual	Total
1. Subriso											
SE Zone, Fresh, 90 to 0 mRL	541,245	26	0.10	0.13	0.22	0.86	0.13	0.98	0.48	0.13	0.60
SW Zone, Fresh, 90 to 57 mRL	329,638	24	0.10	0.13	0.22	0.72	0.13	0.85	0.41	0.13	0.53
SW Zone, Fresh, 57 to (50) mRL	312,859	26	0.08	0.13	0.20	0.70	0.13	0.83	0.39	0.13	0.51
Weighted Mean	1,183,742	25	0.09	0.13	0.22	0.78	0.13	0.90	0.44	0.13	0.56
2. Adoikrom											
Adoikrom, Fresh, 190 to 150 mRL	429,966	23	0.07	0.13	0.20	0.70	0.13	0.82	0.38	0.13	0.51
Adoikrom, Fresh, 150 to 110 mRL	381,857	24	0.08	0.13	0.20	0.69	0.13	0.82	0.38	0.13	0.51
Adoikrom, Fresh, 110 to 0 mRL	748,110	24	0.08	0.13	0.21	0.74	0.13	0.86	0.41	0.13	0.54
Weighted Mean	1,559,933	24	0.08	0.13	0.20	0.72	0.13	0.84	0.40	0.13	0.52
3. Father Brown											
Father Brown, Fresh, 190 to 130 mRL	469,511	25	0.08	0.13	0.21	0.56	0.13	0.68	0.32	0.13	0.45
Father Brown, Fresh, 130 to 110 mRL	349,906	26	0.04	0.13	0.17	0.55	0.13	0.67	0.30	0.13	0.42
Father Brown, Fresh, 110 to 70 mRL	373,543	26	0.05	0.13	0.17	0.58	0.13	0.70	0.31	0.13	0.44
Father Brown, Fresh, 70 to 0 mRL	375,472	27	0.05	0.13	0.18	0.64	0.13	0.76	0.35	0.13	0.47
Weighted Mean	1,568,431	26	0.06	0.13	0.18	0.58	0.13	0.71	0.32	0.13	0.44
4. All											
Weighted Mean	4,312,106	25	0.07	0.13	0.20	0.68	0.13	0.81	0.38	0.13	0.50

13.5.4 PROCESSING COSTS

Wassa's 2007 budget processing cost estimates have been used in conjunction with the HBB physical characteristics and cyanide leach relationships to determine the HBB processing costs for the following two scenarios:

- Campaign (or separate) milling HBB ore through No. 2 mill to a P_{80} product size of 75µm followed by blend CIL treatment with Wassa ore that has been campaign milled through No. 1 mill to a P_{80} product size of 125µm. Seven CIL tanks, being one more than the existing facility have been used for this assessment; and
- Blend milling HBB ore with Wassa ore in a 25-75 ratio through both mills to a P_{80} product size of 125µm followed by blend CIL treatment through seven CIL tanks.

Table 13-13 summarizes those results. The following points are noted:

1) Reconciliation of Predicted and 2007 Budgeted Wassa Processing Cost Estimates. The predicted Wassa processing cost of $4.95/tonne is in excellent agreement with Wassa's 2007 budget milling cost for crushed ore (i.e. excludes heap leach material) of $4.95/tonne. That is, the processing cost model should be a reliable for predicting the HBB processing costs.

2) Campaign Treatment Costs. The weighted mean HBB processing cost is $7.00/t for a weighted mean milling rate of 181tph through No. 2 mill. A strong relationship exists between the processing rate for each of the ten variability samples and the processing cost. That is, the processing cost decreases linearly with an increase in the processing rate.

3) Campaign verses Blend Milling. The mean HBB recovery is estimated to decrease by 3.8% from 92.8% for campaign milling to 89.0% for blend milling. This equates to a $3.48/t reduction in revenue at a gold price of $622/oz.

   Processing costs are estimated to decrease by $0.94/t from $7.00/t for campaign treatment to $6.06/t when HBB ore is blended with Wassa ore on a 25-75 basis. The HBB blend processing costs have been estimated on an incremental cost basis.

   Blend milling is $2.54/t less cost effective on a revenue less processing cost basis than the campaign milling of HBB ore. That is campaign milling of HBB ore through No. 2 mill is recommended in lieu of blend milling.

   The Wassa mill throughput rate only increases by 17% when the P_{80} grind size is increased from 75µm to 120µm.

   A suggestion for campaign milling the HBB ore is to dedicate one of the Wassa mills to processing the HBB ore only. This would involve installing a splitting mechanism at the discharge point of the fine ore stockpile conveyor. In this way the Wassa and HBB ores can both be on the one fine ore stockpile and fed through separate feeders to the individual mills.

4) Predicted Cost for Treating 502tph of HBB Material Through the Wassa Plant. The relationship established between the HBB processing rate and processing cost has been used to predict a processing cost of $5.25/tonne for treating 502tph of HBB material through the Wassa plant. The 502tph processing rate is the same rate as the 2007 budget milling rate. HBB oxide ore would need to be much softer and or the grind size much coarser than the fresh ore to achieve that throughput rate.

Table 13-13: Campaign Milling Vs Blending of HBB Ore

Deposit	Reserve		Recovery			Revenue (US$/t)	Processing Costs (US$/t)			Revenue less
	Tonnes	Grade	Campaign	Blend	Variance	Variance	Campaign	Increment. Blend	Variance	Proc. Costs
1. Subriso										
SE Zone, Fresh, 90 to 0 m RL	541,245	4.48	92.76%	87.22%	-5.54%	($4.96)	$ 7.09	$ 6.03	($1.06)	($3.90)
SW Zone, Fresh, 90 to 57 m RL	329,638	3.64	94.75%	92.88%	-1.87%	($1.36)	$ 6.16	$ 5.34	($0.81)	($0.55)
SW Zone, Fresh, 57 to (50) m RL	312,859	4.66	90.93%	86.80%	-4.14%	($3.86)	$ 7.34	$ 6.34	($1.00)	($2.85)
Weighted Mean	1,183,742	4.29	92.71%	88.44%	-4.27%	($3.67)	$ 6.90	$ 5.92	($0.97)	($2.69)
2. Adoikrom										
Adoikrom, Fresh, 190 to 150 m RL	429,966	5.65	86.84%	82.20%	-4.63%	($5.24)	$ 6.00	$ 5.20	($0.80)	($4.44)
Adoikrom, Fresh, 150 to 110 m RL	381,857	4.57	93.74%	90.86%	-2.87%	($2.63)	$ 6.50	$ 5.78	($0.73)	($1.90)
Adoikrom, Fresh, 110 to 0 m RL	748,110	2.94	87.30%	81.11%	-6.19%	($3.64)	$ 7.06	$ 6.29	($0.77)	($2.87)
Weighted Mean	1,559,933	4.08	88.88%	84.19%	-4.69%	($3.83)	$ 6.63	$ 5.86	($0.77)	($3.06)
3. Father Brown										
Father Brown, Fresh, 190 to 130 m RL	469,511	4.11	93.90%	90.70%	-3.20%	($2.62)	$ 7.27	$ 6.27	($1.01)	($1.62)
Father Brown, Fresh, 130 to 110 m RL	349,906	5.11	96.80%	94.29%	-2.52%	($2.57)	$ 7.25	$ 6.17	($1.08)	($1.49)
Father Brown, Fresh, 110 to 70 m RL	373,543	5.93	96.30%	93.56%	-2.75%	($3.26)	$ 7.50	$ 6.40	($1.10)	($2.15)
Father Brown, Fresh, 70 to 0 m RL	375,472	6.23	96.16%	93.28%	-2.88%	($3.59)	$ 7.81	$ 6.59	($1.22)	($2.37)
Weighted Mean	1,568,431	5.27	95.81%	92.97%	-2.84%	($3.00)	$ 7.45	$ 6.35	($1.10)	($1.90)
4. All										
Weighted Mean	4,312,106	4.57	92.77%	88.97%	-3.81%	($3.48)	$ 7.00	$ 6.06	($0.94)	($2.54)

13.5.5 CONCLUDING REMARKS

From the testwork performed by JMA; the optimum grind size has been determined to be a P80 product size of 75µm for all samples. Through the utilization of a gravity concentration circuit and a leach/CIL circuit, with a residence time of 25 hours, average gold recoveries of 92.8% can be achieved. With minor modifications to the existing process services (water, air and reagents) and comminution (crushing and milling) circuits, an upgrade of the existing gravity concentration circuit, and the installation of new classification cyclones and two additional equipped leach/CIL tanks at a minimum; the Wassa processing facility can adequately treat HBB ore at a rate of 100,000tpm or 1.2Mtpa, whilst being blended with fresh and oxide ores from the existing Wassa Gold Mine concession.

A detailed engineering options study is planned to determine the optimum and most cost effective processing philosophy and plant design criteria for a processing plant feed comprising HBB fresh ores, Wassa fresh and oxide ores, and reclaimed heap leached material. An investigation into and an evaluation of the practicalities and capital cost implications of campaigning HBB ore through one mill will be an integral part of this study. A detailed plant upgrade scope of works will then be defined and implemented over the next twelve months, with a specific objective to minimize any adverse impact on the existing operation during the construction and commissioning period.

14.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

Sections 14.1 to 14.3 have been extracted from the SRK report *Mineral Resource Estimation of the Benso and Hwini-Butre prospects, South West Ghana, January 2007*. (Reference 1).

14.1 BENSO

14.1.1 DATA CAPPING

The following charts show the cumulative Coefficient of Variance ("CV") and the cumulative mean for the principle domains at Subriso East subdivided by drill method. These charts were used to determine whether it was appropriate to employ data cutting at Subriso East.

The plots (Figure 14-1 and Figure 14-2) for the oxide domain show significant inflexions on both the CV and average grade plots around the 5g/t value. Beyond this the graphs increase at a steady rate with another minor inflexion in the DD plot around 8g/t. It was decided not to apply any cutting to the oxide data as the number of samples above these inflexions is relatively high (>10%) and the effect of applying this cut is considered unrealistic and would significantly reduce the grade of the final estimate.

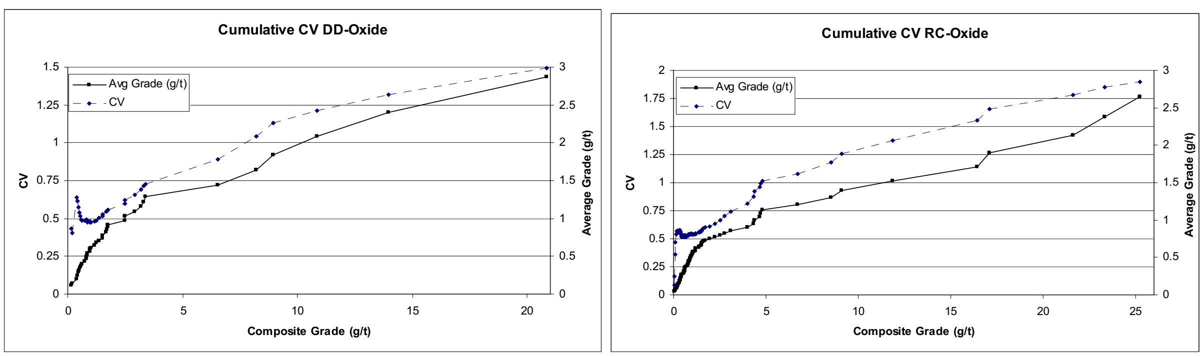
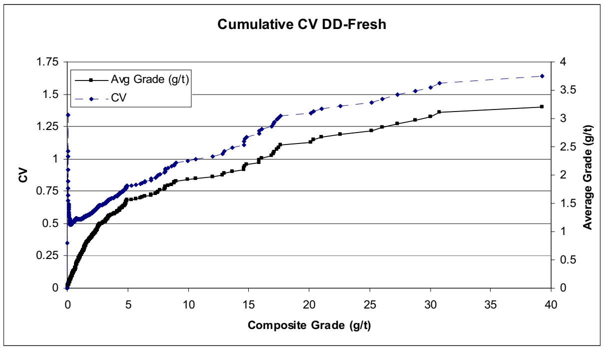


Figure 14-1: Cumulative CV and mean grade for Oxide domain at Subriso East subdivided by drill method

The number of samples available from the fresh horizon is significantly higher and the following plots show the close relationship between the cumulative CV and average grade. Once again major inflexions are present in both the CV and average grade plots at around 5g/t but beyond this the plots climb steadily with possible inflexions around 17g/t but these are not conclusive. It was, again decided not to apply a cut to the data based on these graphs. A cut at 5g/t is considered too harsh and would significantly reduce the average grade of the data available for the Resource estimate.



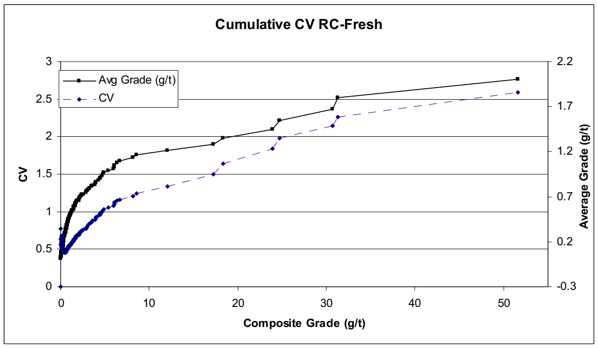


Figure 14-2: Cumulative CV and mean grade for Fresh domain at Subriso East subdivided by drill method

It is considered that the high grade values occur in discrete areas within the orebodies and therefore the effect of cutting these would be to unrealistically reduce the grade of the block estimates in these areas. In addition, the relatively sparse distribution of the high grades will mean that the weighting applied to these composites during the grade interpolation will be effectively reduced.

14.1.2 STATISTICAL ANALYSIS

The following table (Table 14-1) summarizes the statistical analysis of the four major domains at Benso subdivided by oxidation state and drill method. The transition zone at Benso is thin and discontinuous and was not modeled as a separate unit. The RAB drilling has been excluded from the Resource interpolation and is excluded from the following table.

The Subriso East (SE) orebody contains the most data with a roughly 60:40 split between DD and RC drill methods. When the combined drill method data is analyzed the CV value is relatively poor indicating local grade variability within the domain. It is clear that the RC drilling is producing a more variable sample grade, particularly from the fresh horizon which may be due to intersection of the water table.

The Subriso West (SW) orebody exhibits the highest grade from the RC drilling in the fresh horizon with an average grade of 6.2g/t. The DD results are broadly comparable with those from the SE orebody.

The G-Zone data is lower grade than the SE and SW domains but the data variance is considerably lower which is reflected in the low CV values. The I-Zone is poorly drilled and almost exclusively by DD. The grade in the fresh horizon at I-Zone is broadly in line with that seen in G-Zone from the DD composites.

Table 14-1: Summary Statistics for the Benso Domains

Orebody	Domain	Oxidation	No. Comp	Maximum	Mean	Variance	Variat.Coef.
Subriso East	**DD+RC**	OX	125	25.5	2.71	22.8	1.8
		FR	634	51.6	2.75	27.5	1.9
	DD	OX	39	20.8	2.87	17.9	1.5
		FR	396	39.3	3.20	27.3	1.6
	RC	OX	86	25.25	2.64	25.0	1.9
		FR	238	51.6	2.01	26.8	2.6
		Total	**759**	**51.6**	**2.74**	**26.7**	**1.9**
Subriso West	**DD+RC**	OX	32	15.9	3.32	14.9	1.2
		FR	465	103	4.04	71.2	2.1
	DD	OX	24		2.87	11.4	1.2
		FR	395		3.66	73.3	2.3
	RC	OX	8		4.67	22.8	1.0
		FR	70		6.19	54.3	1.2
		Total	**497**	**103**	**3.99**	**67.6**	**2.1**
G-Zone	**DD+RC**	OX	45	20.9	2.93	17.5	1.4
		FR	587	40.3	2.07	9.43	1.5
	DD	OX	29		3.3	24.3	1.5
		FR	444		2.21	11.6	1.5
	RC	OX	16		2.26	4.54	0.9
		FR	143		1.66	2.43	0.9
		Total	**638**	**40**	**2.14**	**10**	**1.5**
I-Zone*	**DD+RC**	OX	3	1.5	1.2	0.1	0.3
		FR	95	15.9	2.55	8.8	1.2
		Total	**98**	**15.9**	**2.51**	**8.5**	**1.2**

* I-Zone was almost entirely drilled by DD and it was felt unnecessary to subdivide by drill method

14.1.3 ESTIMATION

The SE domain is physically separated from the others and strikes to the north with a dip to the west of between 55-60°. The SW, G-Zone and I-Zone domains occur in subparallel structures and strike to the north-west (320°) with a steep dip of 75-80° to the south-west. Because of this it was decided to treat the SE orebody as a separate for the purpose of grade interpolation. The SW and G-Zone data was combined for production of semi-variograms. The I-Zone was deemed to have too few composites to allow production of reliable semi-variograms and the model results from the SW/G-Zone semi-variograms were used for grade interpolation in the I-Zone orebody. In all cases the grade block model for a particular individual orebody was interpolated using only the composites from that orebody.

The following figures and Table 14-2 summarize the geostatistical analysis of the Subriso East data. The variogram map (Figure 14-3) is suggesting a preferred continuity plunging to the south-west in the plane of the orebody. The continuity along strike is also well developed. The directional semi-variograms (Figure 14-4) were modeled in the Gaussian anamorphosis transform and then back transformed for the final model parameters. The anisotropic directional models were not significantly different from those in the along strike and down dip direction and it was decided to use these latter directions as the principal modeled directions. The two stage model only showed a minor anisotropy in the second structure with ranges of 70m down dip and 100m along strike. A minor structure is present at 40m which may be reflecting the drill spacing .

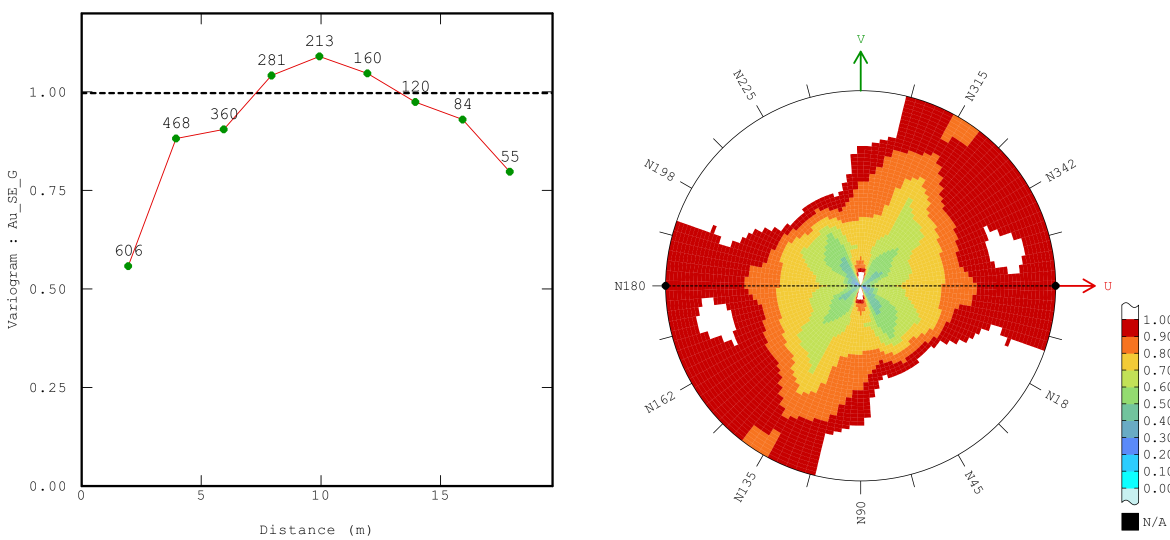


Figure 14-3: Omni-directional downhole semi-variogram and the variogram map in the plane of the Subriso East orebody (000°/55W)

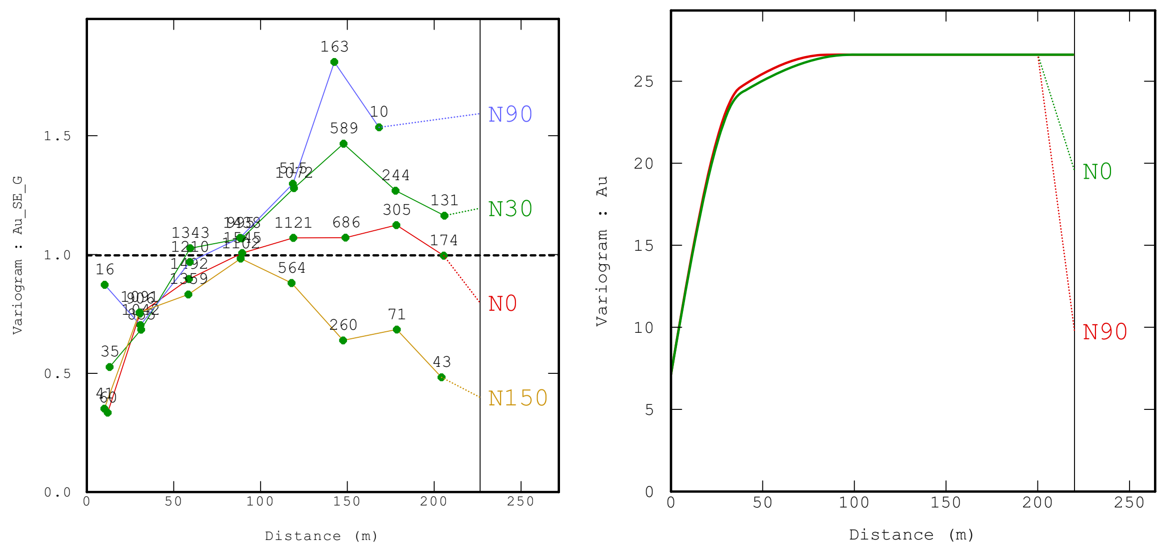


Figure 14-4: Experimental directional semi-variograms (gaussian anamorphosis transformation) in the four principal directions in the plane of the Subriso East orebody (000°/55W) with associated, back transformed model semi-variograms

Table 14-2: Semi-variogram modeling results for the Subriso East orebody

Domain	Structure	Variance	Range 1	Range 2	Range 3
Subriso East	nugget (C_0)	7.14			
	spherical (C_1)	14.26	38m	38m	
	spherical (C_2)	5.22	99m	70m	
	Orientation	Dip dir°/dip	000/00	270/55	

The combined Subriso West and G-Zone semi-variograms are shown below. The variogram map (Figure 14-5) and Table 14-3 is less conclusive than that for the Subriso East orebody and is suggesting several possible continuity directions within the plane of the orebody but these are considered to be artifacts of the drill sample quantity and spacing. The directional semi-variograms (Figure 14-6) were relatively poor and the down-dip direction produced the best model however, the modeled range for all directions was considered to be the same at 50m and therefore an isotropic model was produced with a maximum range of 50m.

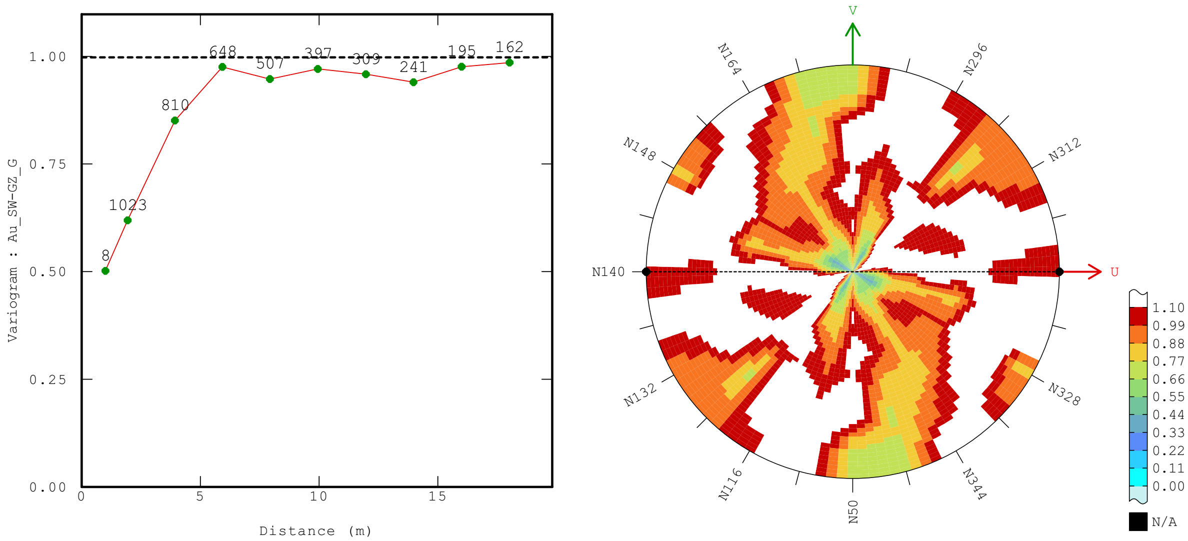


Figure 14-5: Omni-directional downhole semi-variogram and the variogram map in the plane of the Subriso West and G-Zone orebodies (340°/75W).

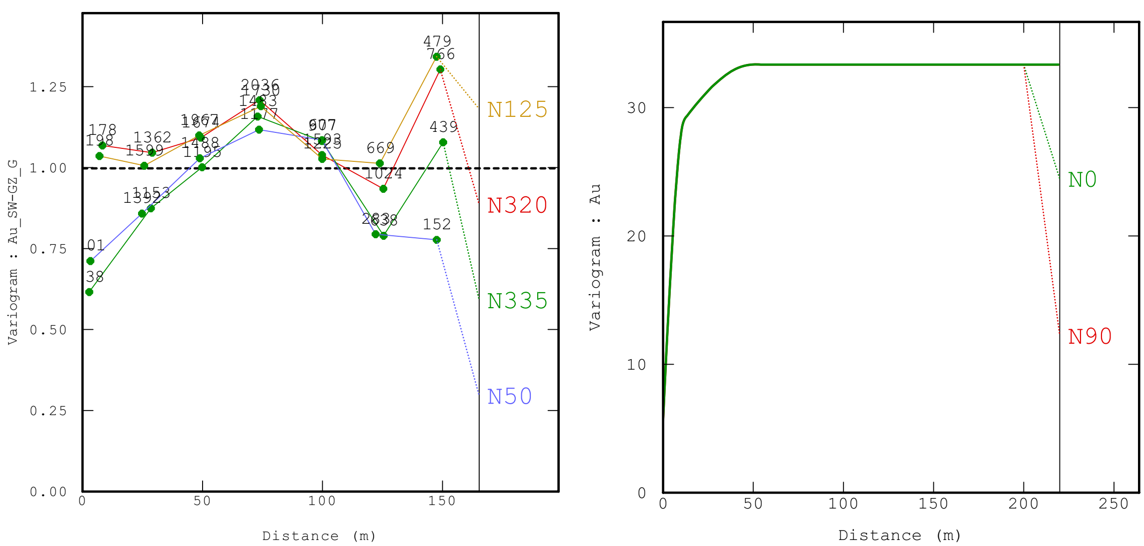


Figure 14-6: Experimental directional semi-variograms (gaussian anamorphosis transformation) in the four principal directions in the plane of the Subriso West and G-Zone orebodies (340°/75W) with associated, back transformed model semi-variograms

Table 14-3: Semi-variogram modeling results for the Subriso West/G-Zone orebody data

Domain	Structure	Variance	Range 1	Range 2	Range 3
Subriso West	nugget (C_0)	5.65			
	spherical (C_1)	21.15	12m	12m	
	spherical (C_2)	6.55	50m	50m	
	spherical (C_3)				
	Orientation	Dip dir°/dip	320/00	230/75	

Grade was calculated for individual blocks using ordinary kriging and a search radius generally greater than the modeled semi-variogram range. The block model was constructed using the following parameters (Table 14-4). Blocks are oriented with the long axis in the north-south direction to take into account the general strike of the Subriso East orebody.

Table 14-4: Benso block model parameters

Direction	Origin	No of cells	Size of cells
X	174000	280	12.5m
Y	56000	160	25m
Z	-400	75	8m

For all domains the first pass interpolation used a minimum of 5 and max of 40 composites. The second search (wider search used to fill outlying blocks) utilized a minimum of 2 composites and a maximum of 40. Descritization was set at 6x12x4 (xyz). Search radii used for the searches were as follows:

- Subriso East - Initial search (Indicated, Measured and Inferred): 100x70x10m (strike, dip, perpendicular); Second search (Inferred only): 500x500x30m
- Subriso West/G-Zone/I-Zone - Initial search (Indicated, Measured and Inferred): 70x70x10m (strike, dip, perpendicular); Second search (Inferred only): 500x500x30m

14.1.4 CLASSIFICATION

Classification was initially based on calculating a slope of regression (Z/Z*) value for individual blocks. All blocks filled using the wider search were assigned an Inferred classification category. Additionally, those blocks which were interpolated from SJR data only in areas where GSR have not carried out confirmatory drilling were classified as Inferred Mineral Resources. Wireframes were constructed around blocks with a SL value of generally greater than 0.75 (75%) and these blocks were assigned an Indicated category. The construction of the classification wireframe did not strictly adhere to this cut-off and blocks with a slope value of between 0.5 to 0.75 were included in the Indicated wireframe for the purposes of continuity and where visual examination of the model in conjunction with the drillhole intercepts indicated that a high degree of confidence could be applied rather than relying solely on the statistical variable.

SRK consider the use of the Slope of Regression method as an aid in assigning classification categories and it provides a good 'first pass' for identification of areas which are relatively poorly informed. However, the SL method of classification should not be considered a rigorous method for application of Mineral Resource categories without taking into account the more obvious physical continuity of the ore bearing structures.

The following figures show the histogram for the slope of regression block values for the individual mineralized bodies at Benso. The graphs show the relatively high confidence in the estimate for Subriso East (Figure 14-7), while the Subriso West (Figure 14-8) and G-Zone (Figure 14-9) show similar distribution with a lower confidence. The I-Zone (Figure 14-10) results are poor and this contributed to the decision to classify this deposit as entirely Inferred at this stage.

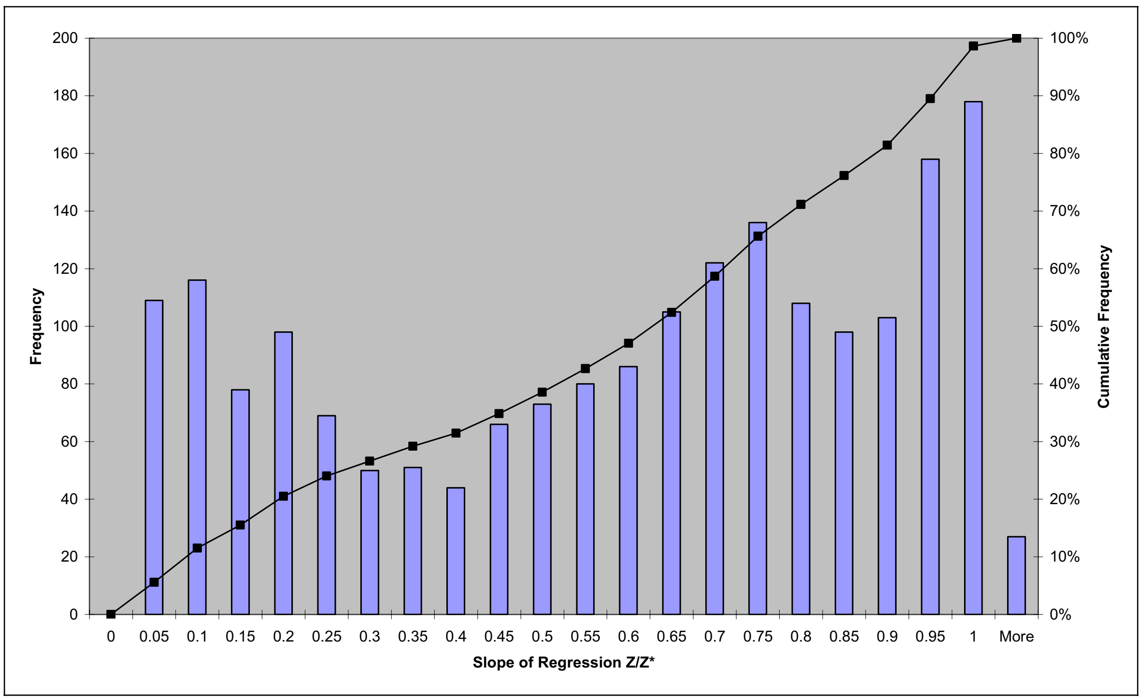


Figure 14-7: Histogram for slope of regression (Z/Z*) at Subriso East.

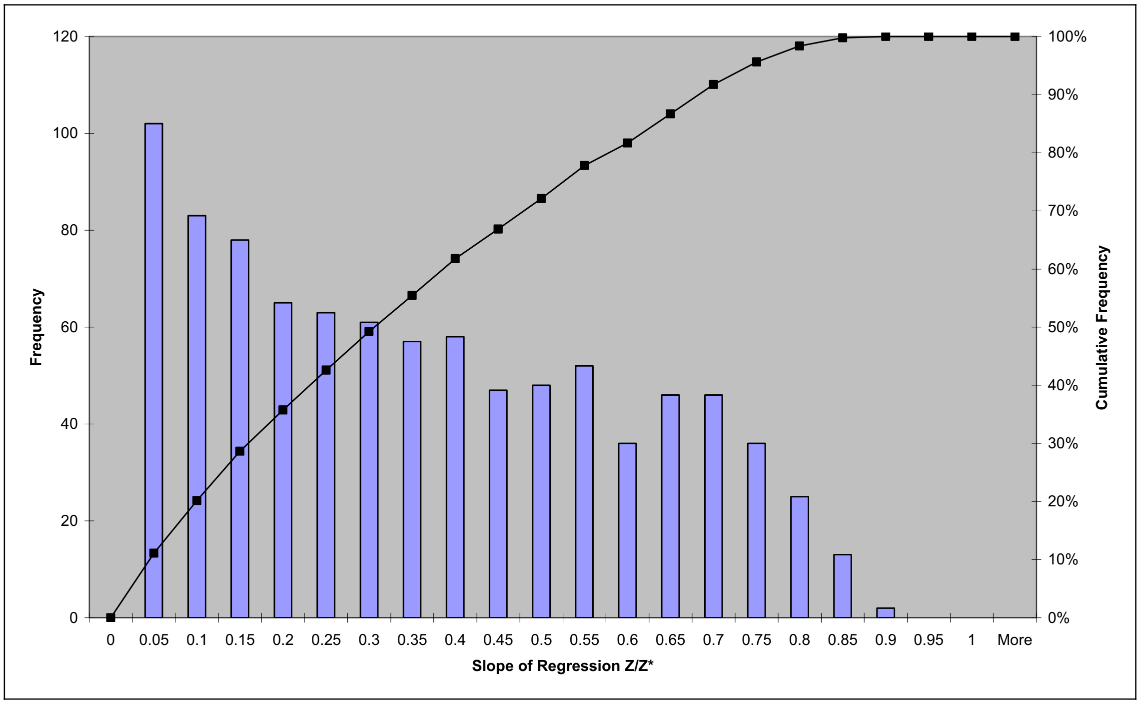


Figure 14-8: Histogram for slope of regression (Z/Z*) at Subriso West.

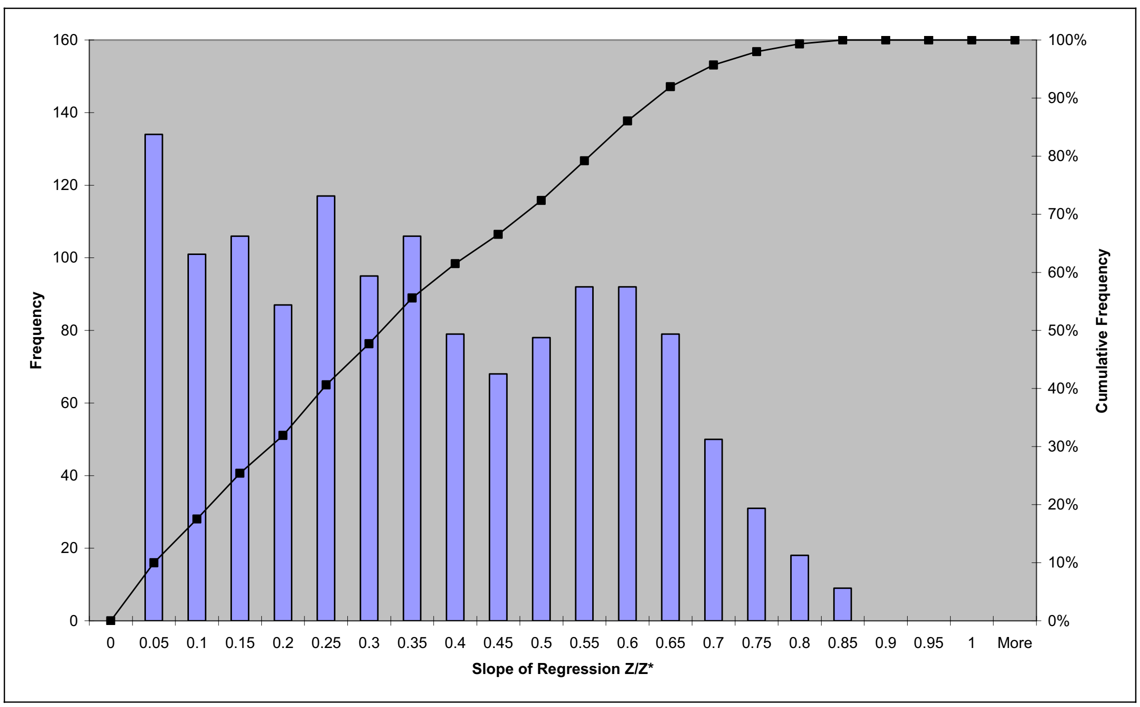


Figure 14-9: Histogram for slope of regression (Z/Z*) at G-Zone.

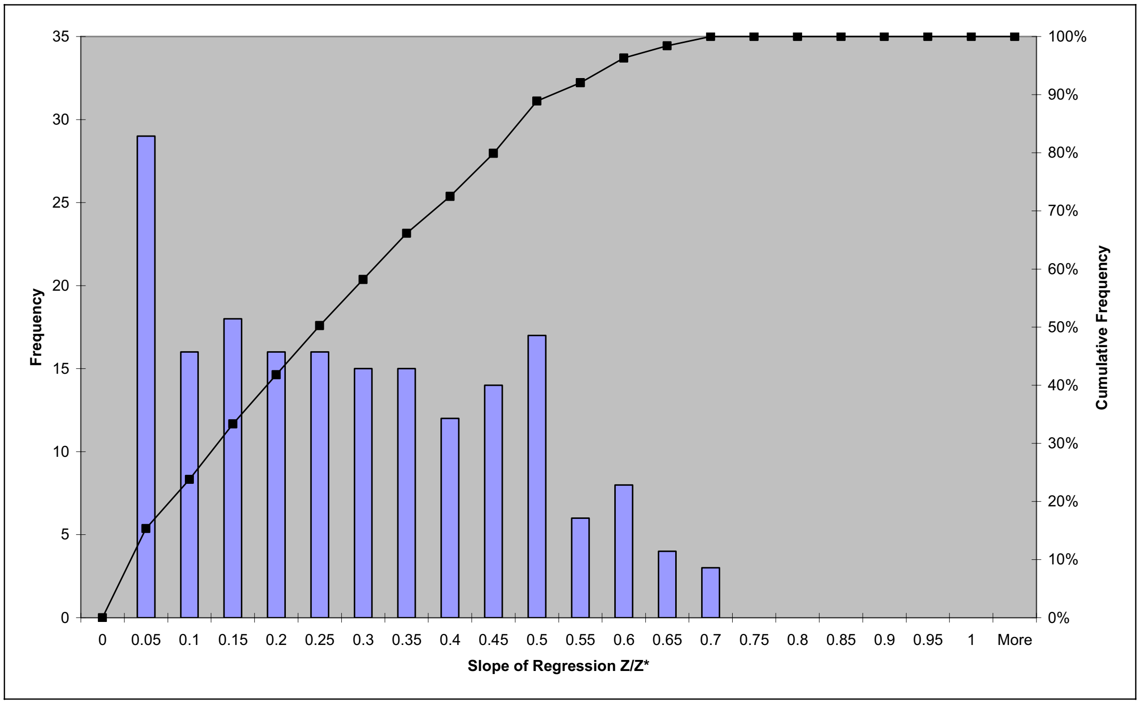


Figure 14-10: Histogram for slope of regression (Z/Z*) at I-Zone.

14.2 HWINI-BUTRE

14.2.1 DATA CAPPING

Composite grades at Hwini-Butre vary significantly both between orebodies and between oxidation states within the same orebody. High grades were recorded with the highest being a value of 212.4g/t at Father Brown.

At Adoikrom both the oxide and fresh data exhibit a clear break in the grade curve at 5g/t but beyond this the CV and mean grade climb steadily with no significant inflexion and no data capping was deemed necessary. Data capping was performed at Father Brown by cutting the fresh data at 100g/t which effectively excluded a single sample at 212.4g/t and effectively reduced the CV value to 1.95. The high grades at Dabokrom occur beyond 20g/t and beyond this point the CV increases significantly from 1.6 to 2.3. However, it was felt that the data distribution at Dabokrom was sufficiently robust to allow the kriging process to effectively reduce the influence of these high grade outliers without the need for data cutting. (Refer Figure 14-11, Figure 14-12 and Figure 14-13)

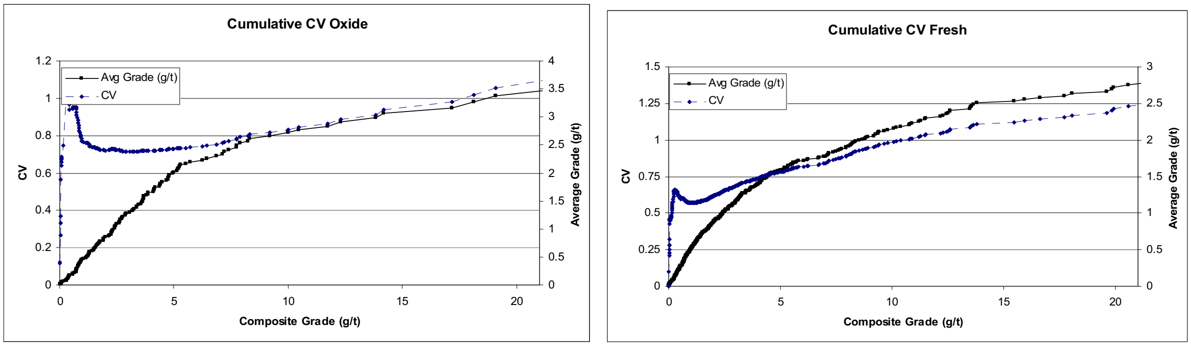


Figure 14-11: Cumulative CV and mean grade for Oxide and Fresh domains at Adoikrom

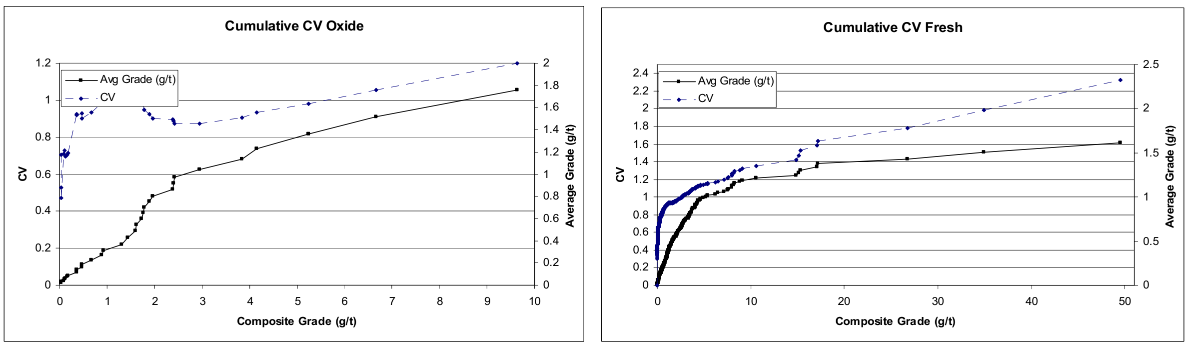


Figure 14-12: Cumulative CV and mean grade for Oxide and Fresh domains at Dabokrom

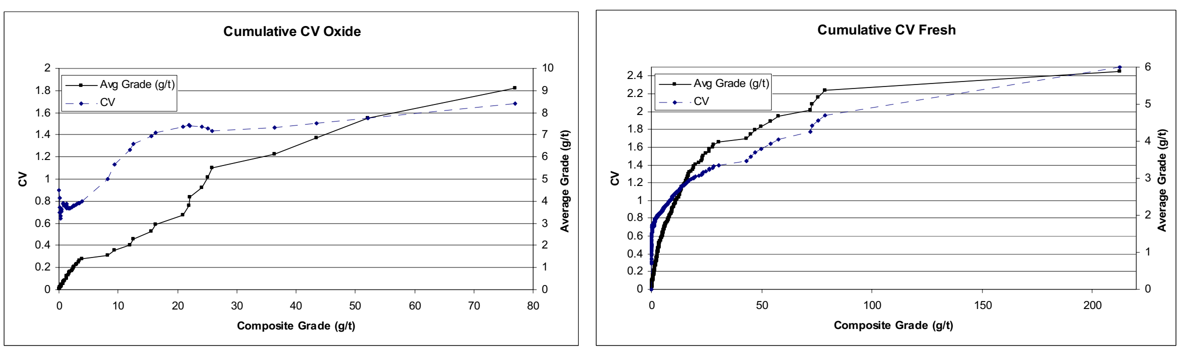


Figure 14-13: Cumulative CV and mean grade for Oxide and Fresh domains at Father Brown

14.2.2 STATISTICAL ANALYSIS

The statistics summarized in Table 14-5 are for the 2m composites prior to any high grade cutting. Statistics are subdivided by drill method and oxidation state except for the Father Brown data which was almost exclusively drilled by DD.

In all cases the oxide domain returns a higher average grade than the fresh. At Adoikrom and Father Brown the difference in grade between the two is substantial and it was decided to carry out interpolation separately for the two domains. At Dabokrom the difference is very slight and it was possible to combine the data for grade interpolation.

Of greater significance is the difference between results from DD and RC drilling within the same oxidation horizon at Adoikrom. The RC data is providing a lower grade and a significantly improved CV result indicating lower variability within the composite assay results. This is possibly due to the difference in sampling protocol between the two drill methods. The DD samples are sampled using logged contacts which included changes in lithology, structure and mineralization style. The RC samples will be taken on strict drilled length intervals and therefore the exact contacts will be smoothed and will lead to inclusion of lower grade material in the ore samples at the contacts. This general smoothing effect is observed in the CV results.

The RC and DD drilling is intermixed throughout the orebodies and SRK consider the approach of using both datasets for the grade interpolation to be appropriate and conservative. The data composites are based on the modeled contacts from the wireframe models which are based on both DD and RC drilling. The strict sampling of sharp mineralized contacts in the DD drilling is unlikely to be replicated in the mining process and the inclusion of dilution in the RC samples will be adding a degree of conservatism to the final Mineral Resource estimate.

Table 14-5: Summary statistics for the Hwini-Butre Domains

Orebody	Domain	Oxidation	No. Comp	Maximum	Mean	Variance	Variat.Coef.
Adoikrom	**DD+RC**	OX	150	61.2	4.21	55.2	1.8
		FR	590	94.3	3.47	45.7	1.9
	DD	OX	86	61.2	4.93	88.8	1.9
		FR	487	94.3	3.94	53.8	1.9
	RC	OX	64	14.2	3.24	8.4	0.9
		FR	103	8.5	1.27	1.7	1.0
		Total	**740**	**94.3**	**3.62**	**47.7**	**1.9**
Dabokrom	**DD+RC**	OX	34	9.6	1.76	4.3	1.2
		FR	461	49.5	1.58	13.8	2.4
	DD	OX	29	9.6	1.80	4.9	1.2
		FR	349	49.5	1.61	15.8	2.5
	RC	OX	5	2.4	1.49	0.6	0.5
		FR	112	17.2	1.49	7.5	1.8
		Total	**495**	**49.5**	**1.60**	**13.1**	**2.3**
Father Brown	**DD+RC**	OX	49	76.9	9.15	238.3	1.7
		FR	405	212.4	5.83	214.6	2.5
		Total <100	*453*	*79.0*	*5.7*	*124.5*	*2.0*
		Total	**454**	**212.4**	**6.19**	**218.3**	**2.4**

14.2.3 ESTIMATION

The following semi-variogram plots (Figure 14-14) and Table 14-6 for Adoikrom were produced from the combined oxide and fresh datasets (DD and RC). Separate semi-variograms were originally produced for the individual data domains and drill methods but the lack of data for the RC datasets and the DD Oxide domain meant that the quality of the resulting models was very poor and considered unreliable for use in the grade interpolation. The combined plots shown below exhibit similar overall trends but with considerably improved quality and therefore confidence in the final models. There is evidence for a two stage structure but the overall range is relatively low at 55m. The small sub-domain of Adoikrom North was excluded and the data cut at 35g/t in order to further improve the quality and assist in defining the range. The directional plots are produced in the plane of the orebody striking north-northeast (005°) and dipping 65° west.

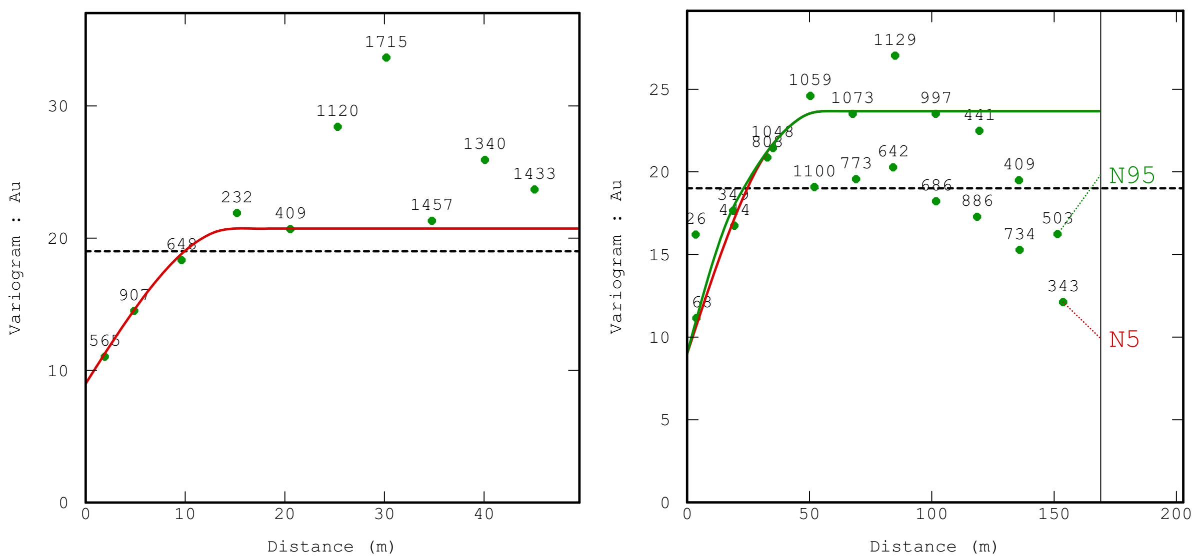


Figure 14-14: Adoikrom downhole and directional semi-variograms

Table 14-6: Semi-variogram modeling results for the Adoikrom orebody

Domain	Structure	Variance	Range 1	Range 2	Range 3
Adoikrom	nugget (C_0)	9.0			
	spherical (C_1)	3.27	35m	20m	
	spherical (C_2)	11.4	55m	55m	
	Orientation	Dip dir°/dip	005°/00	275°/65W	

The following plots (Figure 14-15) and Table 14-7 for the Dabokrom semi-variogram models were produced after declustering the data using a 50mx50m window in order to reduce the effect of the clustering around a series of widely spaced high grade intersections. The Dabokrom wireframe model is currently interpreted as a series of shallow dipping subparallel structures with very little strike extent which is reflected in the sharp fall off in the semi-variogram for the strike direction (000°).

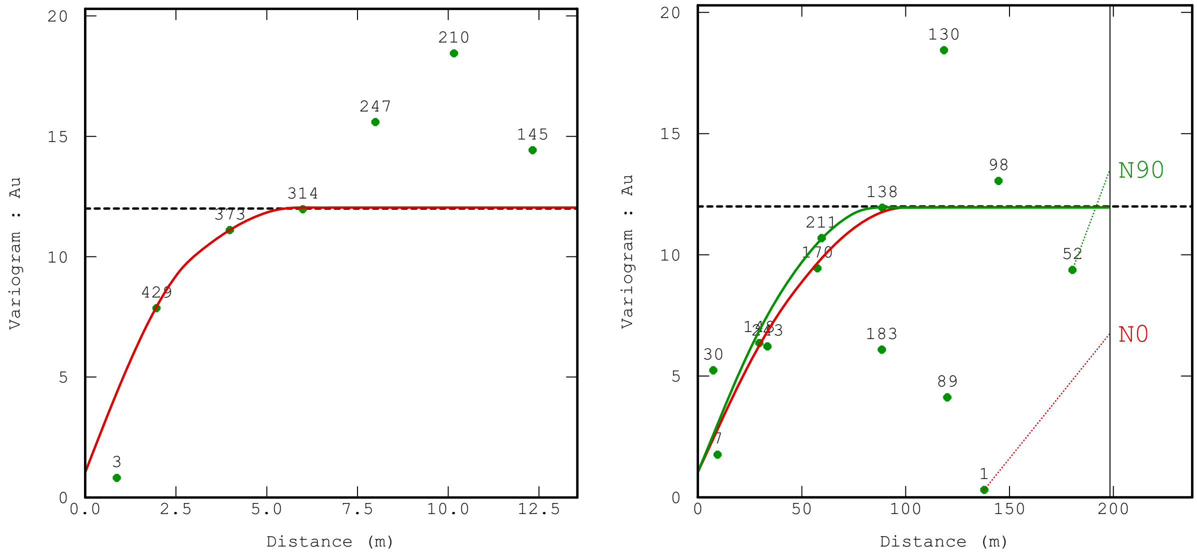


Figure 14-15: Dabokrom downhole and directional semi-variograms

Table 14-7: Semi-variogram modeling results for the Dabokrom orebody

Domain	Structure	Variance	Range 1	Range 2	Range 3
Dabokrom	nugget (C_0)	1.04			
	spherical (C_1)	1.16	41m	41m	
	spherical (C_2)	9.75	100m	87m	
	Orientation	Dip dir°/dip	000°/00	270°/30W	

The Father Brown semi-variograms were poorly defined in the plane of the modeled orebody with a very high nugget variance and no apparent directional anisotropy. The 3D omni-directional semi-variogram (Figure 14-16 and Table 14-8) produced the best structure. Attempts were made to model using a gaussian anamorphosis transformation and by cutting high grades but these actions did not improve the overall quality of the variograms. It was therefore decided to use the omni-directional model for grade interpolation.

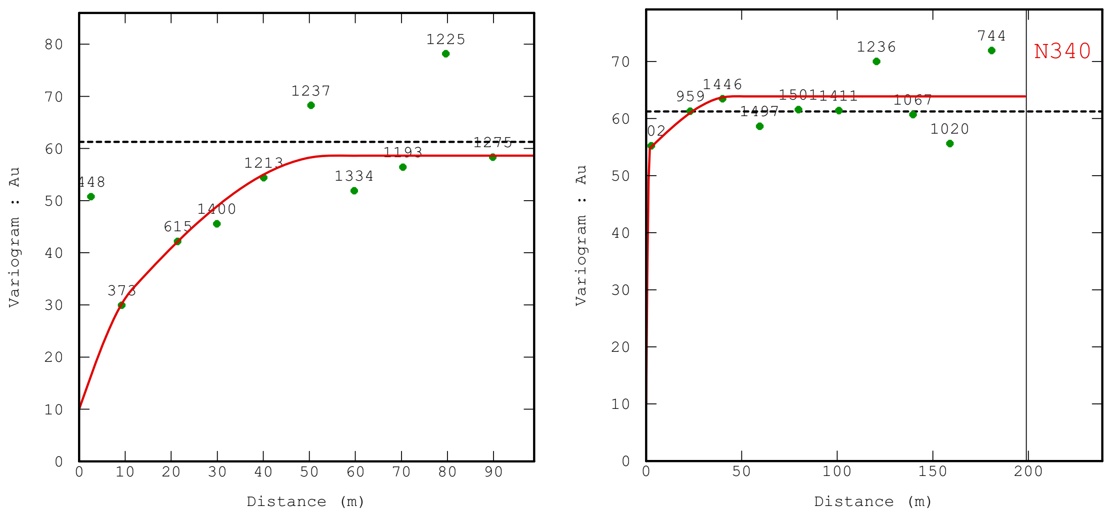


Figure 14-16: Father Brown with omni-directional (left) and directional semi-variogram in the plane of the orebody (right).

Table 14-8: Semi-variogram modeling results for the Father Brown orebody

Domain	Structure	Variance	Range 1	Range 2	Range 3
Father Brown	nugget (C_0)	10			
	spherical (C_1)	11.4	11.4m	11.4m	
	spherical (C_2)	37.2	55m	55m	
	Orientation	Dip dir°/dip	340°/00	250°/45W	

Grade was calculated for individual blocks using ordinary kriging and a search radius generally greater than the modeled semi-variogram range. The block model was constructed using the following parameters (Table 14-9). Blocks are oriented with the long axis in the north-south direction to take into account the general strike of the orebodies.

Table 14-9: Hwini-Butre block model parameters

Direction	Origin	No of cells	Size of cells
X	176000	136	12.5m
Y	32325	103	25m
Z	-400	75	8m

For all domains the first pass interpolation used a minimum of five and a maximum of 40 composites. The second search (wider search used to fill outlying blocks) utilized a minimum of two composites and a maximum of 40. Descritization was set at 6x12x4 (x,y,z). Search radii used for the searches were as follows:

- Adoikrom - Initial search (Indicated, Measured and Inferred): 70x70x20m (strike, dip, perpendicular); Second search (Inferred only): 500x500x30m
- Dabokrom - Initial search (Indicated, Measured and Inferred): 100x100x10m (strike, dip, perpendicular); Second search (Inferred only): 500x500x30m
- Father Brown - Initial search (Indicated, Measured and Inferred): 60x60x20m (strike, dip, perpendicular); Second search (Inferred only): 500x500x30m

14.2.4 CLASSIFICATION

As at Benso, the classification was initially based on calculating a slope of regression (Z/Z*) value for individual blocks. All blocks filled using the wider search were assigned an Inferred classification category. Additionally, those blocks which were interpolated from SJR data only in areas where GSR have not carried out confirmatory drilling were classified as Inferred Mineral Resources. Wireframes were constructed around blocks with a SL value of generally greater than 0.75 (75%) and these blocks were assigned an Indicated category. The construction of the classification wireframe did not strictly adhere to this cut-off and blocks with a slope value of between 0.5 to 0.75 were included in the Indicated wireframe for the purposes of continuity and where visual examination of the model in conjunction with the drillhole intercepts indicated that a high degree of confidence could be applied rather than relying solely on the statistical variable.

The following figures show the histograms for the slope of regression block values for the individual mineralized orebodies at Hwini-Butre. The graphs show the relatively high confidence in the estimate for Adoikrom (Figure 14-17) and Dabokrom (Figure 14-18), while the Father Brown (Figure 14-19) orebody shows a generally lower confidence. It was decided to assign Dabokrom an Inferred category for all blocks at this stage due to the questions over the validity of the current geological modeling and the interpolation based solely on SJR drilling. The Father Brown orebody has been assigned an indicated category for the near surface blocks within the centre of the deposit, despite its relatively poor SL results, due to the detailed drilling in this area and the confidence in the geological continuity.

SRK consider the use of the Slope of Regression method as an aid in assigning classification categories and it provides a good ‘first pass’ for identification of areas which are relatively poorly informed. However, the SL method of classification should not be considered a rigorous method for application of Mineral Resource categories without taking into account the more obvious physical continuity of the ore bearing structures.

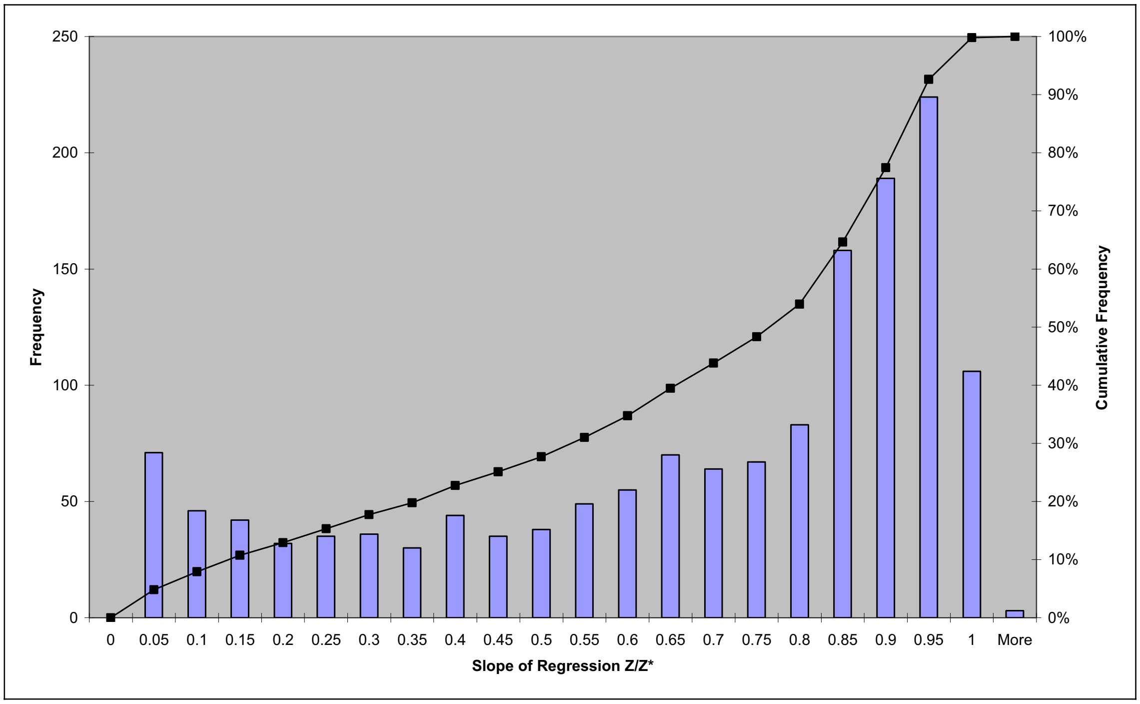


Figure 14-17: Histogram for slope of regression (Z/Z*) at Adoikrom.

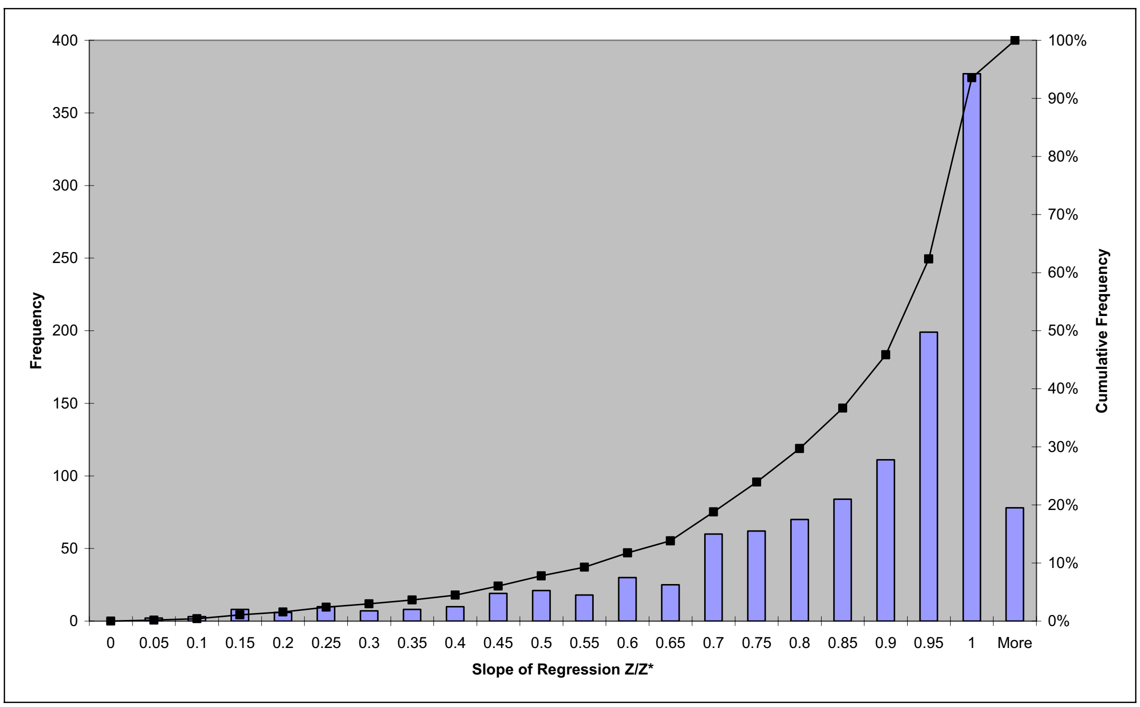


Figure 14-18: Histogram for slope of regression (Z/Z*) at Dabokrom.

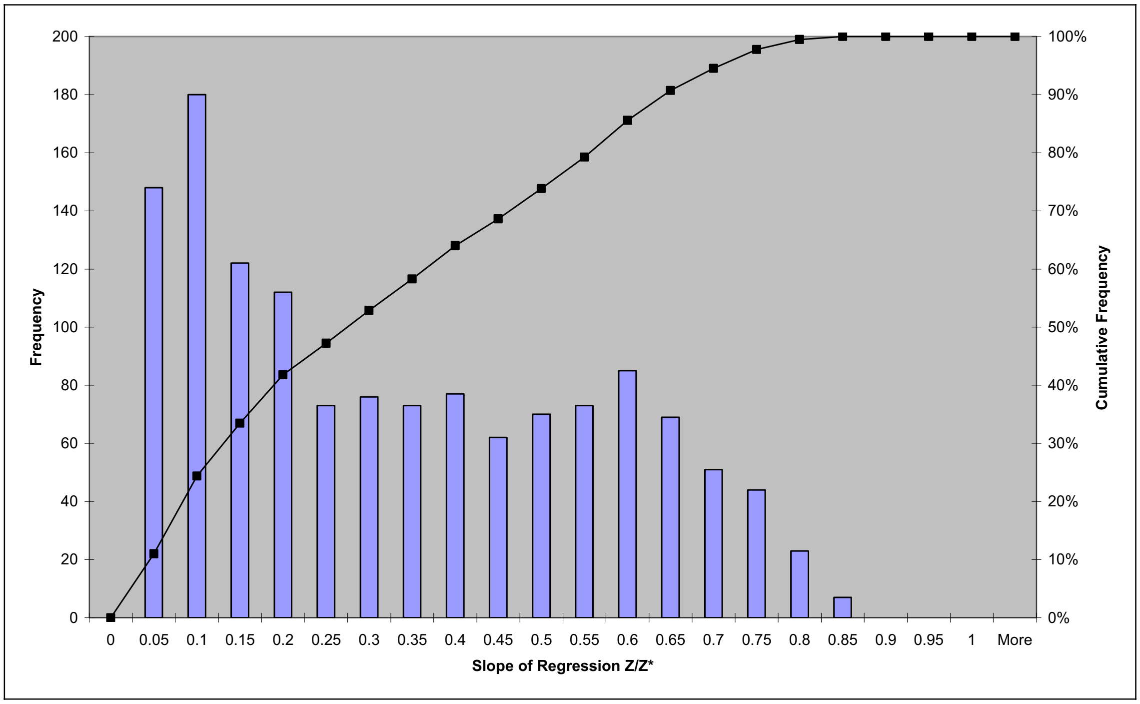


Figure 14-19: Histogram for slope of regression (Z/Z*) at Father Brown.

14.3 SPECIFIC DENSITY DATA

14.3.1 BENSO DENSITY DATA

Specific gravity ("SG") determination was carried out by SGS-Tarkwa on behalf of SJR prior to GSR's involvement in the project. A total of 32 samples were obtained by SJR all within the fresh domain. GSR has carried out independent SG analysis from geotechnical drilling samples with the majority of the 441 samples taken from the fresh horizon. The final values used for the Mineral Resource tonnage estimates are based on a combination of results from SJR and GSR testing with a value of 2.0t/m^3 used for oxide and transition combined and 2.8t/m^3 used for fresh. (Refer Table 14-10).

Table 14-10: Benso Density Test Results

Oxidation	SJR		GSR	
	No. Samples	SG (t/m^3)	No. Samples	SG (t/m^3)
Oxide			21	1.71
Trans			40	2.34
Fresh	32	2.8	380	2.71

14.3.2 HWINI-BUTRE DENSITY DATA

Specific gravity ("SG") determination was carried out by SGS-Tarkwa on behalf of SJR prior to GSR's involvement in the project. A total of 53 samples were measured subdivided by oxide domain and the results are summarized in the following Table 14-11. GSR has carried out independent SG analysis from geotechnical drilling samples with the majority of the 277 samples taken from the fresh horizon. The low number of samples taken by GSR in the oxide and transition domains lends less significance to the values obtained and the final value used for the combined oxide and transition domain was 1.8t/m^3. The value used for the fresh domain was based on the GSR samples with a value of 2.7t/m^3 used.

Table 14-11: Hwini-Butre Density Test Results

Oxidation	SJR		GSR	
	No. Samples	SG (t/m^3)	No. Samples	SG (t/m^3)
Oxide	20	1.74	7	2.03
Trans	20	2.22	7	2.5
Fresh	13	2.82	263	2.71

14.4 MINERAL RESOURCE STATEMENT

GSR has estimated Mineral Resources for each of the HBB deposits using the Mineral Resource block model produced by SRK in October 2006. The Mineral Resources reported by SRK (Reference 1) were unconstrained and inclusive of Mineral Reserves. The Mineral Resources reported herein by GSR were estimated using an optimized pit shell at a gold price of $560/oz. Other than gold price, the same optimized pit shell parameters and modifying factors used to estimate the Mineral Reserves (Refer Section 14.5) were used to estimate the Mineral Resources. Pit designs were developed based on the selected optimized pit shells and the Mineral Resources given below represent the Mineral Resources contained within the designed pits.

Mineral Resources are shown on a 100% basis. Golden Star's share of the Mineral Resources is subject to the Government of Ghana's 10% carried interest which entitles them to a 10% dividend once project capital costs have been recovered.

The total HBB Mineral Resource is presented in Table 14-12 with breakdown by pit in Table 14-13 and Table 14-13.

The Mineral Resource tables in Sections 14.4.1 and 14.4.2 are exclusive of the Mineral Reserves for each pit.

Table 14-12: Total HBB Mineral Resources (excluding Mineral Reserves), April 27, 2007

Orebody	Category	Tonnage (Mt)	Grade (g/t)	Gold (koz)
Total Benso & Hwini-Butre	**Indicated**	0.73	3.23	76
	Inferred	0.89	3.73	107

14.4.1 BENSO MINERAL RESOURCES

Table 14-13: Benso Mineral Resource Statement by Pit (excluding Mineral Reserves), April 27, 2007

Orebody	Category	Tonnage (Mt)	Grade (g/t)	Gold (koz)
Subriso East	**Indicated**	0.05	2.95	4
	Inferred	0.12	4.60	18
Subriso West	**Indicated**	0.13	3.09	13
	Inferred	0.21	3.38	23
G-Zone	**Indicated**	0.23	2.02	15
	Inferred	0.08	2.30	6
I-Zone	**Indicated**	0.00	0.00	0
	Inferred	0.19	3.16	19
Total Benso	**Indicated**	**0.41**	**2.47**	**33**
	Inferred	**0.61**	**3.41**	**66**

14.4.2 HWINI-BUTRE MINERAL RESOURCES

Table 14-14: Hwini-Butre Mineral Resource Statement by Pit (excluding Mineral Reserves), April 27, 2007

Orebody	Category	Tonnage (Mt)	Grade (g/t)	Gold (koz)
Adoikrom	**Indicated**	0.12	3.24	13
	Inferred	0.04	2.18	3
Father Brown	**Indicated**	0.19	4.83	30
	Inferred	0.19	5.51	33
Dabokrom	**Indicated**	0.00	0.00	0
	Inferred	0.06	2.52	5
Total Hwini-Butre	**Indicated**	**0.32**	**4.21**	**43**
	Inferred	**0.29**	**4.39**	**41**

14.5 MINERAL RESERVES

The Mineral Resources and Mineral Reserves are reported by using the definitions and guidelines of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM Definition Standards for Mineral Resources and Mineral Reserves, November 2005) and as required in Canada's National Instrument ("NI") 43-101.

The Mineral Reserves presented in this section have been estimated at a $480/oz gold price. This is consistent with GSR's Mineral Reserve disclosure as at December 31, 2006 and reported in February 2007. The $480/oz gold price approximates the three year average gold price (London fix) as at December 31, 2006. The Mineral Resource models developed by SRK in October 2006 have been used to derive the estimates of the Mineral Reserves.

Details of the key assumptions, parameters and methods used to estimate the Mineral Reserves are discussed in the following sections and throughout this report. In estimating the Mineral Reserves, GSR has considered mining methods, production rate, geotechnical parameters, metallurgical recoveries and operating costs.

14.5.1 PIT OPTIMIZATION

14.5.1.1 Method

Gemcom Enterprise Mining System ("GEMS") was used to create undiluted Mineral Resource block models for use by the Whittle Four-X ("Whittle") pit optimizing software. Based on these resource block models and a set of technical and economic parameters, the Whittle program uses the Lerch-Grossmann algorithm to generate a pit shell where the project operating profit margin, or cash flow, is maximized.

The Whittle process uses the revenue and cost parameters as specified, to generate a series of incremental pit shells, for progressively increasing metal prices (revenue). The smallest shell is therefore the most profitable. At the economic pit limit, the incremental pit shell is exactly at break even, where the revenue equals the operating costs. This is the economic final pit limit. The smaller nested pits shells are very useful to help decide where mining should be started, as these small pit shells are mining the highest profit areas of the ore body. The parameter for generating the incremental pit shells was set to allow the evaluation of the different resource block models at gold prices of $320/oz, $480/oz, $560/oz, and $640/oz.

Whittle reports the results of each incremental nested pit on two bases, estimating:

1) The undiscounted cash flow; and
2) The discounted cash flow.

The 'optimum' pit is then usually chosen by inspecting these cash flows and selecting the pit shell with the maximum total cash flow. The maximum undiscounted cash flow is the pit shell where the incremental pit is breaking even, and is therefore the maximum economic pit in today's revenue/cost terms. If a discount rate is used, the pit shell with the maximum discounted cash flow is always somewhat smaller. However, this smaller 'final pit' will be more profitable.

Using the discount factor specified, Whittle produces two cash flows based on different scheduling scenarios. The first case, namely the Best Case, assumes that mining progresses strictly according to a series of incremental nested pit shells. This scenario is optimistic, and is not practical, but it does indicate the highest possible project value that might be achievable. The second case, namely the Worst Case, assumes that mining progresses on a bench by bench basis, mining to the limit of the 'final' pit. This scenario indicates the lowest possible project value. In reality, the pit will operate somewhere between the two cases, where intermediate and practical cutbacks are defined and then mined in sequence.

If the discount factor is 0%, the cash flows for the best and the worst cases will be equal, and therefore the 'optimum' pit shell (maximum cash flow) will be the same.

The resulting pit shell series is analyzed to determine the undiscounted cash flow from each shell. Considering the relatively short mine life of each of the HBB ore bodies, optimum pit shells were selected based on the maximum undiscounted cash flow.

The Lerch-Grossmann algorithm is founded on mining whole blocks only. The resulting pit shells are quite irregular and do not incorporate ramps. The pit shell results are used for preliminary project economic analyses, to assess the sensitivity of the project due to changes to input parameters, and to guide intermediate and final pit design.

14.5.1.2 Input Parameters

Pit optimization inputs are estimated from first principles and are based on productivity models and equipment selection tables. The metallurgical parameters have been derived from laboratory testwork from representative ore samples. (Refer Table 14-15).

The input parameters for the optimization included the following:

- Pit slope angles: The recommended inter-ramp slope angles (at a factor of safety of 1.2) as given in Section 16.1.4. As Whittle requires an overall slope angle an allowance of some 5° was used to account for access ramps.
- Mining cost: This cost item includes drilling, blasting, loading and hauling. The hauling cost of ore is to the surface ROM and that of waste is to surface waste dumps. A mining cost adjustment factor has been derived to simulate the increase in the mining cost due to longer haul distances as each pit gets deeper.
- Mining dilution and mining recovery: It was assumed that a dilution factor of 10% waste will be included with ore during the mining operation. The mining recovery was assumed to be 95%.
- Processing cost: This is the cost per tonne of ore for crushing and processing the ore in the Wassa CIL plant.
- Administration cost: This is the cost per tonne of ore of administration and overheads (G&A) for running the mining operations.
- Rehabilitation cost: A rehabilitation cost per tonne of ore is allowed for. This is for rehabilitating the waste dumps and for funding mine closure.
- Processing recovery: Process recovery factors have been estimated for each ore type.

- Selling Costs: A royalty factor of 3% of revenue was used.
- Product Price: A gold price of $480/oz was used.
- Mineral resources: Only Measured and Indicated Mineral Resources were considered for ore potential in the optimization. Inferred Mineral Resources were treated as waste.

Table 14-15: HBB - Optimization Parameters

	Adoikrom		Father Brown		Benso	
Item	**Oxide**	**Fresh**	**Oxide**	**Fresh**	**Oxide**	**Fresh**
Waste Mining ($/t mined)	1.15	1.24	1.19	1.26	1.21	1.38
Ore Mining ($/t mined)	1.41	1.51	1.55	1.62	1.54	1.71
Rehabilitation ($/t ore)	0.22	0.22	0.22	0.22	0.22	0.22
Haulage Cost ($/t/km)	0.15	0.15	0.15	0.15	0.15	0.15
Haulage Distance (km)	82	82	82	82	52	52
Total Haulage Cost ($/t ore)	12.30	12.30	12.30	12.30	7.80	7.80
G & A ($/t ore)	2.66	2.66	2.66	2.66	2.66	2.66
Process Cost ($/t ore)	5.17	6.63	5.17	7.45	5.17	6.90
Recovery (%)	88.9%	88.9%	95.8%	95.8%	92.8%	92.8%
Dilution (%)	10%	10%	10%	10%	10%	10%
Royalty (%)	3%	3%	3%	3%	3%	3%

14.5.2 PIT DESIGN

Following from the pit optimization exercise, and considering the relatively short life of each pit, Whittle pit shells at a revenue factor of one (maximum undiscounted cash flow) were selected as a template for the design of the practical pits.

14.5.2.1 General

The Whittle pits are based on mining whole ore and waste blocks from the block model, which results in the pit shells being quite irregular in shape. The design of practical pits ensures that all material can be mined with a minimum of difficulty and smoothes out the Whittle shells.

Practical pit designs endeavor to extract the majority of the economic ore within the pits however it is not always possible to practically mine all of the ore indicated by the Whittle shells. For example, this is most evident in the base of the Whittle shells where the program infers that the pits will be mined down to a point. This is not possible with earth moving equipment so the last few meters of the pit shells are often ignored and the pits are designed with a flat floor large enough for the mining equipment to work in. The smallest area that the equipment can work in is referred to as the "minimum mining width".

The following assumptions have been made for the mining of the ore bodies:

- Mining equipment will be backhoe configuration excavators;
- Pit Wall Configuration – as per geotechnical recommendations in Section 16.1.4. ; and
- Surface access roads will be developed linking the various pits and surface dumps.

In-pit ramps have been designed using the following parameters:

Hwini-Butre

- Ramp width (major) 22m
- Ramp width (minor) 18.5m and 15m
- Ramp gradients 10%

Benso

- Ramp width 12.5m (with passing bays at Berm crossings)
- Ramp gradients 12.5%

Practical pit designs are provided in Section 19.0. The pit designs were developed using GEMS software. The pit designs were used to generate triangulated surfaces representing the end mining topography. These surfaces were then used to extract the Mineral Resource tonnages and grades on a bench-by-bench basis from the respective block models. The extracted block model summaries were then diluted and mining losses applied to estimate the Mineral Reserves.

14.5.3 ECONOMIC CUT-OFF GRADES

Cut-off grades used for estimating Mineral Reserves have been based on considering all cost beyond the pit rim. Costs that have been included are the extra ore haulage beyond the pit, processing, general site administration (both at HBB and at Wassa) and royalties and selling costs.

The Marginal Cutoff grades (Table 14-16) have been estimated using the equation

$$\text{Cut-off Grade (g/t)} = \frac{\text{(Incremental mining cost + process cost + G\&A Cost) x dilution – Rehab}}{\text{(Product Price – Sales Cost (Royalty)) x Recovery}}$$

The incremental mining cost is the extra cost that would be incurred (for example, grade control and haulage costs to Wassa etc) should a block of material be defined as ore rather than waste. Any material with grade greater than or equal to the cut-off grade will be classified as ore and sent to the Wassa plant.

Table 14-16: HBB - Reserving Cut-Off Grades

	Oxide (g/t)	Fresh (g/t)
Benso	1.13	1.26
Hwini-Butre	1.48	1.61

Production and cost models for estimating operating costs were developed for each mining option studied in the DFS. These models estimate productivity and unit costs of drilling, blasting and load and haul and are based on first principles. Parameters estimated in the production models include equipment selection, bucket fill factors, operator efficiency and numerous others.

Summarizing all of these cost models results in economic cut-off grades being estimated for each pit which will determine what gold bearing material can be economically mined and processed and hence be classified as ore. If the cut-off grades are not met then the material will be classified as waste or sub economic material.

During mining operations ore can be displaced or “lost” and waste added to the ore. This is referred to as “mining losses” and “dilution” respectively. Due to the narrow nature of the ore bodies, ore is expected to be lost due to vertical and horizontal movement resulting from blasting. For the DFS it has been assumed that 5% of the ore will be lost to waste. At the same time that ore is lost the void left by this ore is generally filled with either waste material or low grade material potentially below the cut-off grade. Therefore a dilution factor of 10% has been added. That is, the ore tonnes have been increased by 10% but with waste at zero grade.

14.5.4 MINERAL RESERVES STATEMENT

The Mineral Reserves for the HBB concessions are those mineralized materials within practical engineered pits using the cut-off grades pertaining to the specific pits. Within each pit, the Mineral Resource category has been used as the guide to the classification of the Mineral Reserves within the pit. Measured Mineral Resources were generally converted to Proven Mineral Reserves and Indicated Mineral Resources converted to Probable Mineral Reserves. Any Inferred Mineral Resources within the pit have been excluded from the Mineral Reserve.

The estimated Mineral Reserves as at April 27, 2007 for the HBB concessions are presented in Table 14-17 below. All Mineral Reserves are reported on a 100% basis. GSR’s share of the Mineral Reserves is subject to the Government of Ghana’s 10% carried interest which entitles them to a 10% dividend once project capital costs have been recovered.

At a gold price of $480/oz the Mineral Reserves are 4.13Mt @ 4.35g/t for contained gold of 576,600oz. The average waste to ore stripping ratio varies between 4.6:1 at Benso and 8.9:1 for the pits at Hwini-Butre. The overall stripping ratio is 6.5:1.

The Mineral Reserves for the individual pits are presented in Table 14-18 to Table 14-19. These Mineral Reserves are estimated from the engineered and geotechnically approved pit designs which are presented in Section 19.0.

Table 14-17: HBB - $480/oz Mineral Reserves – Summary, April 27, 2007

Mineral Reserve Category	Tonnes (Mt)	Gold Grade (g/t)	Ounces (koz)
Total			
Proven Mineral Reserves:	0.00	0.00	0
Probable Mineral Reserves:	4.13	4.35	577
Total Proven and Probable	**4.13**	**4.35**	**577**

Table 14-18: HBB - $480/oz Mineral Reserves - Hwini-Butre, April 27, 2007

Mineral Reserve Category	Tonnes (Mt)	Gold Grade (g/t)	Ounces (koz)
Adoikrom (Hwini-Butre)			
Proven Mineral Reserves:	0.00	0.00	0
Probable Mineral Reserves:	1.14	4.97	182
Total Adoikrom Proven and Probable	**1.14**	**4.97**	**182**
Father Brown (Hwini-Butre)			
Proven Mineral Reserves:	0.00	0.00	0
Probable Mineral Reserves:	0.68	6.44	142
Total Property Father Brown Proven and Probable	**0.68**	**6.44**	**142**

Table 14-19: HBB - $480/oz Mineral Reserves – Benso, April 27, 2007

Mineral Reserve Category	Tonnes (Mt)	Gold Grade (g/t)	Ounces (koz)
Subriso East (Benso)			
Proven Mineral Reserves:	0.00	0.00	0
Probable Mineral Reserves:	0.95	3.49	106
Total Subriso East Proven and Probable	**0.95**	**3.49**	**106**
C Zone (Benso)			
Proven Mineral Reserves:	0.00	0.00	0
Probable Mineral Reserves:	0.10	2.95	10
Total C Zone Proven and Probable	**0.10**	**2.95**	**10**
Subriso West (Benso)			
Proven Mineral Reserves:	0.00	0.00	0
Probable Mineral Reserves:	0.83	4.08	109
Total Subriso West Proven and Probable	**0.83**	**4.08**	**109**
G Zone (Benso)			
Proven Mineral Reserves:	0.00	0.00	0
Probable Mineral Reserves:	0.42	2.03	27
Total G Zone Proven and Probable	**0.42**	**2.03**	**27**

15.0 OTHER RELEVANT DATA AND INFORMATION

The ore from the HBB operations will be hauled to the Wassa processing plant and the gold will be recovered in the CIL plant at this site. Following is a description of the Wassa operation.

15.1 WASSA GOLD MINE

The Wassa mine is located in the Mpohor Wassa East District, in the Western Region of Ghana. It is 80km north of Cape Coast and 170km (straight-line) west of the capital Accra. It is also 50km by gravel road from GSR's mine and process plant site at Bogoso. The property lies between Latitudes 5º 25' and 5º 30' north, and between Longitudes 1º 42' and 1º 46' east

The Wassa mining lease (No. 2033/1944) lies within the Subri-Akyempim Concession, and covers an area of 57km^2 with the southern portion being located within the Subri Forest Reserve. There are five recognized mineral prospects located within forest reserves, with Wassa being one of two for which there is a formal mining lease (as opposed to an exploration license). Despite the existence of the mining lease, prior approval is required for any activity within the forest reserve.

None of the currently defined Wassa Mineral Reserves are within the Forest Reserve, and are therefore unaffected by any such restrictions.

The owner of the Wassa mining lease is a Ghanaian registered company Golden Star (Wassa) Limited ("GSWL"), in which GSR has a 90% interest. In common with other mining companies in Ghana, GSWL will pay a royalty to the Government of Ghana at a rate of between 3% and 6% on all gold sales revenues.

15.1.1 PROJECT HISTORY

The Wassa area has witnessed several eras of local small scale and colonial mining activity from the beginning of the century, and mining of vein structures are evident from the numerous pits and adits covering the Wassa lease area.

In recent times, the property was operated since 1988 as a small scale gravity circuit by a Ghanaian Company, Wassa Mineral Resources Limited. In 1993, Wassa Mineral Resources were looking for a capital partner to further develop the mining lease, and invited the Irish companies Glencar Exploration Limited ("Glencar") and Moydow Ltd to visit the concession. Following this visit, Satellite Goldfields Limited ("SGL") was formed between Wassa Mineral Resources, Glencar and Moydow Ltd. The mining lease, which is valid for a 30 year period expiring in 2022, was assigned by Wassa Mineral Resources Limited to SGL.

Extensive satellite imagery and geophysical interpretations were carried out, which identified a strong > 1g/t gold target. Exploration drilling commenced in February 1994, and by March 1997, 58,709m of RC and DD had been completed. In September 1997, consulting engineers Pincock, Allen and Holt had completed a feasibility study, which determined a proven and probable mineable reserve of 17.6Mt at 1.7g/t, for a total of 932,000oz contained.

Construction of the Wassa Mine was initiated in September 1998 after Glencar secured a $42.5M debt-financing package from a consortium of banks and institutions, primarily SBLL and the Commonwealth Development Corporation.

The Wassa Mine was developed as a 3Mtpa open pit heap leach operation with a forecast life of mine gold production of approximately 100,000oz per annum. The first ore from the pit was mined in October 1998. After approximately one years production it became evident that the predicted heap leach gold recovery of 85% in the oxide ore, could not be achieved, mainly due to the high clay content of the ore. After a number of attempts to improve on the recovery, including increased agglomeration and doubling the leach solution application rate, it was concluded that the achievable gold recovery on oxide ore by heap leach, was between to 55% to 60%. Recoveries within the fresh material were better, but still below predicted levels.

The combined effect of the lower than planned gold recovery and a lull in the gold price at the time resulted in SGL not being able to service its debt to the banks. In early 2001 the banks together with Glencar decided to sell the project to recover some of the accumulated debt.

Mining was stopped at the end of October 2001 and irrigation of the heap leach with cyanide solution continued until March 2002, after which rinsing of the heaps with barren solution continued until August 2002. As at October 2002, 8.3Mt of ore had been stacked at an average grade of 1.66g/t amounting to 444,500oz contained gold. Actual gold production from this property was 256,800oz.

When the secured senior creditors exercised security over the project in 2001, they put the project up for sale with the issuance of an Information Memorandum dated May 2001. GSR was invited amongst other parties to conduct a due diligence on the operation, and in November, negotiations were started to acquire the Wassa assets. As part of a final due diligence on the resources, GSR undertook a structural evaluation and drilling program between December 2001 and April 2002. Upon completion of the acquisition of Wassa Mine by GSR, a further exploration program was undertaken. Both these exploration programs formed part of a feasibility study that was completed in July 2003 which demonstrated the economic viability of reopening and expanding the existing open pits, and processing the ore through a conventional CIL processing plant.

15.1.2 WASSA MINERAL RESOURCES AND MINERAL RESERVES

The Mineral Resources for Wassa were estimated by CUBE Consulting, Australia, in conjunction with GSR in December 2006.

Table 15-1 summarizes the Mineral Resources by deposit as at December 31, 2006. The Mineral Resources are exclusive of those Mineral Resources included in the $480/oz Mineral Reserves. All Mineral Resources are constrained by a $560/oz optimized pit shell with the exception of the Heap Leach Mineral Resource.

Table 15-1: Wassa - Mineral Resources (at $560/oz gold price), December 31, 2006, (excluding Mineral Reserves)

Deposit	Measured		Indicated		Measured & Indicated		Inferred	
	Tonnes (Mt)	Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Tonnes (Mt)	Grade (g/t)
Main	0.19	1.08	7.09	0.84	7.27	0.85	6.47	1.16
SAK	0.03	0.82	1.10	0.93	1.13	0.93	0.70	1.41
Heap Leach (Phase 1)	0.00	0.00	3.47	0.52	3.47	0.52	0.00	0.00
Total 2006	**0.21**	**1.05**	**11.66**	**0.75**	**11.87**	**0.76**	**7.17**	**1.18**

As at December 31, 2006, the Wassa mine has a Proven and Probable Mineral Reserve of 13.6Mt with an average grade of 1.11g/t containing approximately 483,300oz of gold. (Refer Table 15-2). The Wassa Mineral Reserves were generated by Wassa site personnel under the guidance of Mr. P. Bourke. Mr. E Urbaez has not been involved with the Wassa optimization process.

Table 15-2: Wassa - Mineral Reserves (at $480/oz gold price), December 31, 2006

Category	Tonnes (millions)	Gold Grade (g/t)	Contained Ounces (millions)
Proven	0.5	1.08	0.02
Probable	13.0	1.11	0.46
Total Proven & Probable	**13.6**	**1.11**	**0.48**

15.1.3 OPERATIONS

The Wassa operation consists of two principle mining areas, namely the SAK Pit and the Wassa main pit. The operation is a conventional selective mining truck and excavator operation utilizing 2 x Liebherr 994's and 1 x Liebherr 984 excavator sharing a fleet of nine Caterpillar 777D off highway trucks. This fleet is supported by an auxiliary fleet of D9 bulldozers, wheel loaders and graders. All ore and waste mining is performed on three meter high flitches with blasting taking place on either 6m or 9m benches.

A fleet of Atlas Copco F9's, L7 and L8 drill rigs perform the drilling and blasting for this operation with African Explosives Limited ("AEL") providing a down the hole explosives delivery service.

During the 2007 Budget year Wassa will mine 3.43Mt of ore @ 1.32g/t and 9.7Mt of waste. The ore and waste is a combination of fresh rock and oxide material.

The 2007 Budget forecasts Wassa to process 4.12Mt of ore @ 1.04g/t (for 125,000oz), the shortfall of material from the pit is made up by the reprocessing of the old heap leach material, which is being reprocessed to recover the remaining gold.

The Wassa processing plant consists of the following main stages:

- Crushing
- Milling
- Gravity Circuit
- Carbon in Leach
- Electrowinning from Cyanide Solution
- Gold Calcining and Casting

Crushing is a four-stage operation consisting of a 160kW primary jaw crusher, a 200kW secondary cone crusher, two 200kW tertiary cone crushers and four 200kW quaternary cone crushers, together with associated screens and conveyors.

Milling is carried out by two 3.0MW ball mills operating in parallel, with lime and cyanide addition. The gravity circuit comprises two 30kW Knelson centrifugal concentrators together with associated equipment. The carbon in leach plant circuit consists of six 2,500m^3 leach tanks, together with cyanide addition, elution circuit and carbon recovery. To recover the gold from solution there are three electrowinning cells installed together with the two calcining ovens and a casting furnace for the final pouring of gold bullion.

16.0 ADDITIONAL REQUIREMENTS FOR TECHNICAL REPORTS ON DEVELOPMENT AND PRODUCTION PROPERTIES

16.1 MINING OPERATIONS

16.1.1 MINING METHOD

The mining method proposed to be used in each of the open pits will be conventional truck and excavator mining on a selective ore mining basis. The mineralized zones vary from near vertical to flat dipping at 20º, the widths of the ore zones vary from one meter wide to 12m wide. It is proposed to use cushion blasting to minimize the horizontal and vertical movement of the ore blocks and to mine benches between 2.5 and 3.0 vertical meters. Due to the narrow nature of the ore zones, controlled drill and blasting will be critical to the success of the operation; as excessive horizontal and to a lesser extent vertical movement could result in significant ore loss if poor blasting and mining practices are utilized.

Ore mining will typically take place by approaching the dipping ore blocks from the hanging wall side of the ore body to minimize ore loss and contamination. The waste will be stripped from the face of the ore blocks and taken to waste dumps adjacent to each pit. Once all the waste is removed the excavator can commence mining of the ore zone under strict supervision from geological technicians that need to be present at all times that ore mining takes place. The ore will be loaded into a combination of 50t and 95t capacity trucks and hauled to a surface Run of Mine (“ROM”) pad for rehandling later to the Wassa processing plant. Strict controls will be in place at all times to monitor grade and tonnages to ensure that ore loss and ore dilution are kept to a minimum.

The DFS recommends that GSR purchase mining equipment and perform the mining instead of utilizing a mining contractor. This option has been chosen as it more profitable and has the highest NPV over the alternatives. This method of mining is also consistent with the existing GSR operations at Bogoso/Prestea and Wassa which also utilize owner mining fleets.

16.1.2 MINING EQUIPMENT

The proposed HBB mining equipment will be a combination of Liebherr 994 and 984 hydraulic excavators matched with fleets of Caterpillar 773 and 777 off-highway dump trucks. The fleet will vary during the mining life depending on the waste to ore stripping ratios and pit depth which will vary with time.

Supporting this primary production fleet will be Caterpillar D9 dozers and Caterpillar 14M graders. Water carts will be used to control dust. Typically dust suppression water will be laid by a combination of Volvo type road registered water trucks and dedicated off highway water carts typically Caterpillar 773’s which have been converted with 49,000L water tanks.

The following mining and sundry equipment will be required for HBB (Refer Table 16-1). Due to the distance between the Benso and the Hwini-Butre operations, it will be necessary for each operation to be self sufficient in dozers, water carts and graders etc.

Table 16-1: HBB - Equipment List

Make	Type	Model	No. of units	Source
Liebherr	Excavator	994	1	Wassa
Liebherr	Excavator	984	1	New
Caterpillar	Truck	777F	5	3 Wassa, 2 New
Caterpillar	Truck	773F	5	New
Caterpillar	Water Cart	773F	2	1 Wassa, 1 New
Caterpillar	Grader	14M	2	1 Wassa, 1 New
Caterpillar	Dozers	D9T	4	New
Caterpillar	Vibrating Roller	CS-563E	1	New
Caterpillar	Excavator & Hammer	345B	1	New
Atlas Copco	GC Drills	L8	2	Wassa
Atlas Copco	Blasthole Drills	L7	2	New
Volvo	Water Cart	FM 6 x 4	2	New
Volvo	Service Truck	FM 6 x 6	1	New
Ancillary Equipment				
Not Specified	Medium Head dewatering pumps		3	New
Not Specified	High Head dewatering pumps		2	New
Allight	Lighting Towers		8	New
Not Specified	45T Crane		1	New

Drilling and blasting will take place in transitional and fresh rock to aid excavation. The drilling and blasting process will require strict design and implementation controls to ensure good fragmentation results are achieved without significant displacement of the mineralized zones. Typically, blast-hole drilling will be by Atlas Copco track mounted drill rigs such as L7's and L8's. The blast-hole rigs will drill 5m to 10m deep holes with bits sizes typically ranging from 102mm to 127mm diameter. A typical pattern for a 115mm diameter hole in fresh rock would have a burden of 3.2m and spacing between holes of 3.7m. These holes will be drilled five vertical meters in the ore zones and will have 0.7m of sub drill added in fresh rock. This particular pattern has been used in the financial models of the DFS.

Explosives will be a combination of Emulsions and Ammonium Nitrate Fuel Oil ("ANFO") depending on how much water is encountered in the blast holes. Both mining areas are expected to have wet ground conditions due to the proximity of rivers and due to the significant rainfall and surface water recharge in this region, therefore in the DFS 100% Emulsion use was factored into all blasting cost tables. All blast holes will be initiated using Nonel technology detonators and lead lines to reduce noise generation from blasting. Powder factors will vary from 0.2kg/m^3 to 0.45kg/m^3 in oxide and transitional material and 0.5kg/m^3 to 0.7kg/m^3 in fresh rock.

16.1.3 PRODUCTION RATE

The ore tonnage to be mined and hauled from HBB and processed at Wassa will be in the order of 100,000 tonnes per month or 1.2Mtpa. (Refer Figure 16-1). This production rate effectively provides approximately 30% of the Wassa mill feed with the remainder coming from the Wassa open pits. The combined annual throughput at the Wassa processing plant will be in the order of 4 Mtpa.

This annual production rate of 1.2Mtpa of ore has been chosen as it is sustainable for the duration of the HBB operations and provides consistent and constant ore supply to Wassa without over extending any of the mining processes.

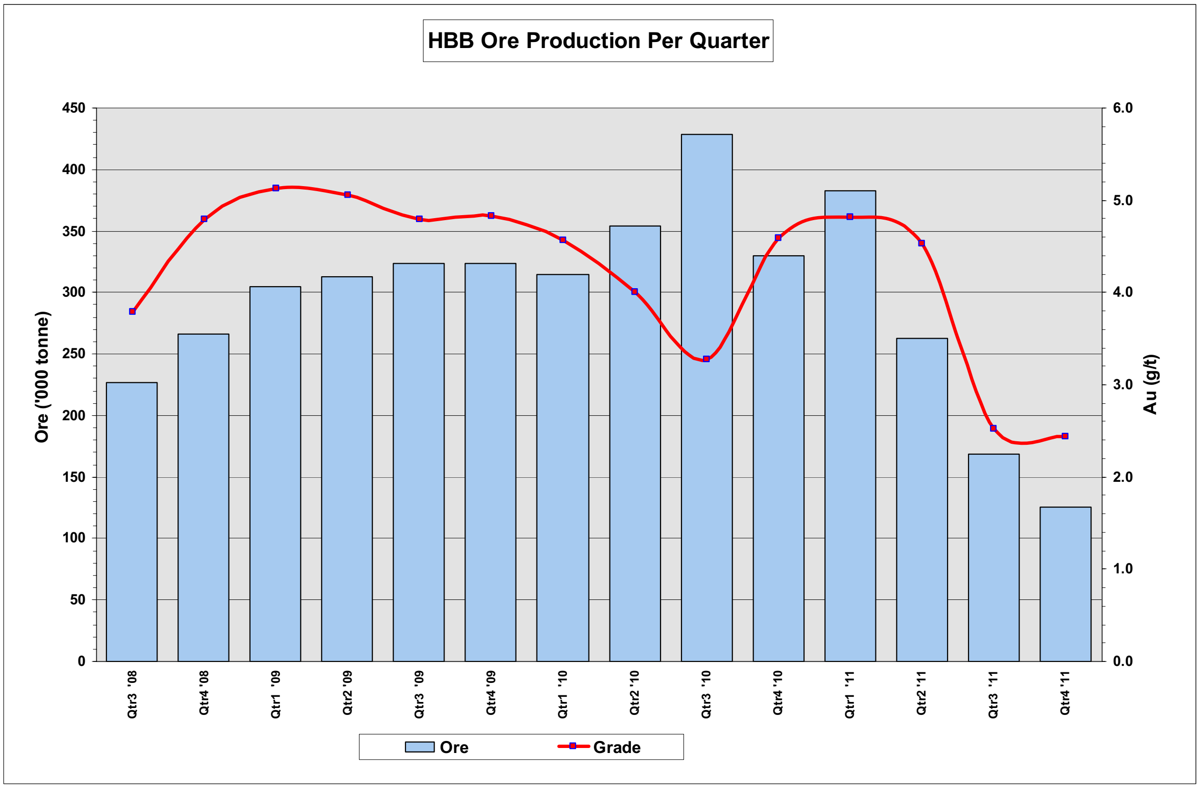


Figure 16-1: HBB - Ore Production by Quarter

16.1.4 SLOPE ANGLE DESIGN RECOMMENDATIONS

The strength of the rock masses at both Hwini-Butre and Benso are generally very high. Consequently, relatively steep overall and inter-ramp slope angles are likely to be achievable in the fresh rock. These deposits are significantly different from others in the area, in that the weaker oxide and transition units are relatively thin and consequently will be exposed over very limited wall heights (10m to 30m).

The stability analyses indicate factors of safety of less than one for the oxide and transition slopes cut at 35°. SRK are satisfied that, after inspection of the core, a 35° slope angle in these materials is achievable, provided that appropriate drainage/slope dewatering measures are implemented.

The slope angle recommendations presented below assume that the pit walls are fully drained. The presence of groundwater or groundwater pressures behind slopes mined at these angles may give rise to some degree of slope instability.

Subriso East

The final slope recommendations presented in the geotechnical study after considering the testwork results combined with engineering judgment are as follows:

Overall Slope Limiting Angle

- Footwall Slope – 52°
- Hanging wall Slope – 54°

Subriso West

The final pit design slope recommendations presented in the geotechnical study are as follows:

Overall Slope Limiting Angle

- Footwall Slope – 55°
- Hanging wall Slope – 55°

G-Zone

The final pit design slope recommendations presented in the geotechnical study are as follows:

Overall Slope Limiting Angle

- Footwall Slope – 53°
- Hanging wall Slope – 55°

C-Zone

At the time of the geotechnical evaluation and recommendations, the C-Zone pit was not in the Indicated Resource category and was only Inferred at the time. Therefore no geotechnical recommendations specific to this pit have been made. As a requirement of the DFS the C-Zone pit design has been reviewed by SRK and the pit has been approved. The pit is primarily oxide and has been designed with a 35º Inter-ramp angle.

Adoikrom

The final pit design slope recommendations presented in the geotechnical study are as follows:

Overall Slope Limiting Angle

- Footwall Slope – 57°
- Hanging wall Slope – 57°

Father Brown

The final pit design slope recommendations presented in the geotechnical study are as follows:

Overall Slope Limiting Angle

- Footwall Slope – 57°
- Hanging wall Slope – 57°

16.1.5 HYDROLOGY

Due to the proximity of the Ben and Subri Rivers to the open pits at Benso, SRK were contracted to perform a hydrological and hydrogeological study on the operation. SRK were chosen to perform this work as they were already performing the geotechnical assessment, and the ground and surface water conditions will play an important part in the geotechnical stability of the operations.

No hydrological assessment has been performed at Hwini-Butre as there are no rivers present in the vicinity of the pits. Only drainage from two valleys will report to the pit areas which can be managed and mitigated by surface trenches and drains.

Summarizing the hydrology studies, it is estimated there is a 6% chance of a 1:50 year rainfall event occurring in the three year mine life of the Benso pits and the volume of water flowing down the Ben and Subri Rivers will be $102m^3/s$ and $141m^3/s$ respectively. Even though the chance of a 1:50 year event is low, the more frequent events are significantly large and combined with the fact that the Subriso West and Subriso East pits are exposed on the flood plains of the Subri River means that flood abatement bunding is still required

16.1.6 PROPOSED STORMWATER MANAGEMENT

The G-Zone pit is located in the floodplain of both the Ben and Subri Rivers, and both the Subriso West and Subriso East pits are located within the floodplain of the Subri River. Therefore each of these three proposed pits require some form of storm water control measure to be constructed to prevent flooding from a 1:50 year storm event.

Flood protection bunds will be constructed around those parts of the Benso pits that project into the watercourse floodplains. The bunds will be constructed on the relatively flat land of the watercourse floodplain and will terminate where the crest elevation meets the higher land adjacent to each pit. A buffer of at least 20m will be left between the pit edges and the pit-side toe of the bund. The bunds will be constructed with suitable material and compacted according to good engineering practice. Waste oxide and rock from the mining operations will be largely used for this construction.

16.1.7 PIT DEWATERING

Final design of pit dewatering at Benso cannot take place until the boreholes mentioned in the DFS are drilled and the testwork completed as recommended.

Pit dewatering will be able to be managed by using localized in-pit sumps in strategic locations with diesel powered mobile pumps lifting the water to the surface and connecting to a surface collection area with discharge to the receiving environment if water quality parameters permit.

16.1.8 WASTE ROCK DISPOSAL

Fresh and oxide waste rock materials from all of the operations will be deposited in dedicated surface waste dumps adjacent to the pits. The waste dumps will be constructed in 20m lifts with rehabilitated batter slopes of approximately 20º. Every 20m a 10m wide berm will be left to dissipate the velocity of water run-off from the dump.

As the waste dump reaches the final design limits, the faces will be progressively dozed down to the required angle and then covered with suitable planting medium to allow the closure and land use plan to be implemented.

There is a significant amount of sub-economic material that still contains gold and merits stockpiling on site as a “Low Grade” material. It is planned to construct low grade compartments inside the waste dumps, where all low grade material will be stockpiled. In this manner the location of the low grade material will always be known and if economics allow, then this material can be recovered from the waste dumps and processed as required. As will be discussed in Section 16.1.9 the ore has the potential to generate acid rock drainage (“ARD”) due to the association of pyrites and other iron oxides with the gold mineralization. Therefore, the low grade materials will be completely contained within the waste dump and eventually capped with oxide materials to reduce the infiltration of air into the rock mass.

Backfilling of the pits has been investigated to reduce the visual impact of the operations and to reduce the costs associated with rehabilitation and closure, but the small nature of the pits and the requirement to mine multiple pits consecutively does not generally allow backfilling. To minimize the visual impact of the dumps they will be designed and constructed to blend-in with the existing hilly topography where possible.

16.1.9 ACID BASE ACCOUNTING ANALYSIS

The acid base accounting (“ABA”) test results thus far have been inconclusive. The work has shown that the majority of the samples tested demonstrate a neutralizing behavior and therefore can be evaluated as having a low acid generating risk. However, some samples have the potential to generate acid and further investigation is required as the behavior of each rock type is unclear.

It is noted that sampling of the project area was incomplete as no tests were performed on any of the transitional material that often contains remnant sulphides and no test samples were taken for any of the Hwini-Butre deposits.

Therefore, it has been concluded that some rocks within the Benso pits will generate acid rock drainage and further testwork is recommended to eliminate this uncertainty and to be able to place appropriate costs for waste rock management and the treatment of potential acidity from the dumps and pit walls. More work is required to clearly identify:

- Which rock types have the potential to produce acid;
- Determine where in the pit layouts these rocks exist; and
- To quantify the volumes each of these rocks.

In the absence of any ABA testwork for Hwini-Butre, no conclusions can be reached on this deposit. Therefore testing for this concession is required prior to the commencement of mining.

16.1.10 PRODUCTION SCHEDULE

The production schedule for the HBB project is modeled to be as follows. Pre-stripping and mining of ore and waste will commence at both operations mid to late Q2 of 2008. Ore haulage will not take place until the third quarter of 2008 which is when the haulroad is expected to be completed. One Liebherr 984 excavator and a fleet of Cat 773 trucks will mine the Benso operation and one Liebherr 994 excavator and a fleet of Cat 777 trucks will mine at the Hwini-Butre operation. The excavation fleets will mine continuously until the Hwini-Butre operation is completed in Qtr 2, 2011 and the Benso operation will finish in Qtr 4, 2011.

The annualized production for all pits is shown in Table 16-2.

Table 16-2: HBB - Mining Production Schedule

Benso - MINING PRODUCTION SCHEDULE BY YEAR										
	Oxide (ORE)		Fresh (ORE)		Total Ore		Oxide (WASTE)	Fresh (WASTE)	TOTAL WASTE	S/R
Year	('000 tonne)	(g/t)	('000 tonne)	(g/t)	('000 tonne)	(g/t)	('000 tonne)	('000 tonne)	('000 tonne)	(t/t)
2008	84	3.82	43	2.89	127	3.50	1338	150	1,488	11.7
2009	87	4.12	504	4.04	591	4.06	968	2387	3,356	5.7
2010	93	1.89	797	3.22	891	3.08	876	2213	3,089	3.5
2011	71	2.51	619	3.37	690	3.28	708	2032	2,740	4.0
2012							0	0		
TOTAL	335	3.08	1,964	3.47	2,299	3.41	3,890	6,783	10,673	4.6

Hwini Butre - MINING PRODUCTION SCHEDULE BY YEAR										
	Oxide (ORE)		Fresh (ORE)		Total Ore		Oxide (WASTE)	Fresh (WASTE)	TOTAL WASTE	S/R
Year	('000 tonne)	(g/t)	('000 tonne)	(g/t)	('000 tonne)	(g/t)	('000 tonne)	('000 tonne)	('000 tonne)	(t/t)
2008	240	3.56	126	6.65	366	4.62	1762	516	2,278	6.2
2009	70	8.41	604	5.42	675	5.73	2023	3545	5,568	8.3
2010	29	9.92	508	5.41	537	5.65	165	6492	6,656	12.4
2011	0		249	6.01	249	6.01	0	1834	1,834	7.4
2012										
TOTAL	339	5.10	1,487	5.62	1,826	5.52	3,949	12,388	16,337	8.9

Total HBB - MINING PRODUCTION SCHEDULE BY YEAR										
	Oxide (ORE)		Fresh (ORE)		Total Ore		Oxide (WASTE)	Fresh (WASTE)	TOTAL WASTE	S/R
Year	('000 tonne)	(g/t)	('000 tonne)	(g/t)	('000 tonne)	(g/t)	('000 tonne)	('000 tonne)	('000 tonne)	(t/t)
2008	324	3.63	169	5.68	493	4.33	3,100	667	3,766	7.6
2009	157	6.04	1,108	4.79	1,265	4.95	2,991	5,933	8,924	7.1
2010	122	3.78	1,306	4.07	1,427	4.05	1,041	8,704	9,745	6.8
2011	71	2.51	869	4.13	940	4.01	708	3,867	4,574	4.9
2012										
TOTAL	674	4.10	3,451	4.40	4,125	4.35	7,839	19,170	27,010	6.5

16.1.11 MANPOWER

The mining operation for HBB, in many ways will be very similar to the Wassa mine site as the numbers of production machines at each site will be very similar. The primary difference being that there will be no requirement for process plant operations and plant maintenance personnel. Administration and human resource functions will be primarily manned from Wassa with site personnel at Benso more as "data entry" clerks to monitor the daily HBB operations. Even with the assistance from Wassa there will be a requirement of 228 personnel to be based permanently between the HBB sites. The total HBB manning estimate is shown in Table 16-3, this is excluding the ore haulage contractor and ancillary staff which will equate to a further 161 people.

Table 16-3: HBB - Manning excluding Contractors

	Grade Classification	Planning / Survey	Mine Geology	Mine Operations	Workshop	Admin	Total
Senior Staff	E3	0	0	1	0	0	1
	E4	0	0	0	1	0	1
	G3	0	0	0	0	2	2
	G4	0	0	1	1	2	4
	G5	2	1	4	4	1	12
	G6	2	3	0	0	0	5
	Total	4	4	6	6	5	25
Junior Staff	J1	0	0	11	3	0	14
	J2	0	8	18	30	7	63
	J3	4	21	45	13	10	93
	J4	0	3	24	3	3	33
	Total	4	32	98	49	20	203
	Grand Total	8	36	104	55	25	228

16.1.12 INFRASTRUCTURE

As the Benso and Hwini-Butre sites are separated by 30km it is important that minimal services are duplicated at each operation which will save considerable costs. It is planned that the main senior staff accommodation, workshop and administration facilities will all be all based at Benso.

At Benso, a technical services office will be constructed on site that will include offices and facilities for geologists, mining engineers, survey, safety and other administrative services. The Hwini-Butre operations will be administered from Benso and then both of these operations will primarily be administered from the Wassa mine site.

16.2 RECOVERABILITY

The estimated metallurgical recoveries (Table 16-4) are based on the metallurgical testwork and analysis discussed in Section 13.0 of this report. The recommended recoveries for campaign milling the HBB deposits are based on the grind-residue grade relationships (plus their soluble gold loss allowances) and their Mineral Reserve grades.

Table 16-4: HBB - Recommended Metallurgical Recoveries

Subriso/Benso:	92.8%
Adoikrom:	88.9%
Father Brown:	95.8%
Mean:	92.8%

Two additional leach/CIL tanks will need to be installed at the Wassa processing facility and the leach/CIL circuit configured so as to comprise one leach tank and seven adsorption (CIL) tanks.

16.3 MARKETS AND CONTRACTS

Currently all GSR gold production is sold to a South African gold refinery in accordance with an existing contract. It is currently planned for HBB gold production, which will become part of the Wassa gold production to also be sold to the same refinery under the same terms. The gold is sold in the form of dore bars which are predominantly gold by weight with the remaining portion being primarily silver. Revenue is recognized when title is transferred at the refinery. The sales price is based on the London P.M. fix on the day of delivery to the refinery.

The global gold market is competitive with numerous banks and refineries willing to buy gold on short notice, therefore it is believed that the loss of GSR's current customer would not materially delay or disrupt project revenues. Companies may export gold (minerals) to any foreign refining group upon approval by the Government of Ghana. However, the Government has a pre-emptive right to purchase any gold produced at a fair market price, though to date this right has never been exercised.

16.4 ENVIRONMENTAL CONSIDERATIONS

In comparison to most mines, the activities planned for the HBB project will have quite limited physical impact in the surrounding areas. The negative impacts can be effectively minimized by establishing a well-planned environmental monitoring and management program that has input from established consultants, carried out by competent, experienced company staff and audited by independent experts. GSR has a commitment to maintain the highest standards in this regard and has very experienced personnel to ensure that such standards are maintained.

Based on many case histories in other parts of southern Ghana, the positive and negative aspects of mining are well-established in many of the rural areas.

The **negative impacts** will mainly include the following:

- Living costs will increase for many living in the nearby towns;
- Some environmental degradation;

- Pressure on existing amenities by growing population;
- Conflicts arising from changes in land-use;
- Changes in socio-economic patterns and traditions resulting from influx of newcomers, some with increased wealth;
- Potential spread of communicable diseases; and
- Many small-scale miners may be displaced and some farmers will lose their land on a temporary basis.

The **positive impacts** will include:

- Increased employment;
- Infrastructure development through roads and power supply;
- Wealth creation;
- More commerce; and
- Increased payment of taxes, royalties and dividends.

16.4.1 COMPENSATION

In the past twelve months there has been a considerable influx of persons into the Benso area with the native vegetation being slashed and burned and speculative farms being established within close proximity of the proposed mining operations. Included with these farms has been a significant increase in the number of buildings being constructed. This development is clearly occurring in the anticipation that GSR will pay compensation for those farms and buildings within the mining areas. In order to halt this speculative development GSR has delineated the mining area and has completed farm surveys by identifying the farm boundaries, land holder, crop age and crop type. Compensation rates have been negotiated with the local communities and agreement has been reached on rates that are a combination of typical mining industry rates and the existing GSR rates.

The speculative buildings, many of which have never been lived in, will not be paid for as they are not genuine inhabited structures. In total, 129 of the 344 structures surveyed to date are speculative and not genuine buildings.

At Benso, the farm development has slowed as a result of the compensation surveys. The payments to the landholders will be made once a Mining Lease is granted.

At Hwini-Butre, the farms in the mining areas are more genuine palm plantation and speculative farming has not been an issue in this area.

16.4.2 PERMITTING SCHEDULE

The Environmental Impact Assessment ("EIA") process for the HBB project has been on-going for some years with a Scoping Study submitted to the EPA by SJR in October 2004 which was subsequently followed with an EIS document in October 2005 for the development of the mine on the basis that a CIL processing plant and tailings facility would be constructed at Mpohor. The Scoping Study and EIS documents where approved by the EPA and an Environmental Permit EPA/EIA/175 was issued to SJR in February 2006 for the project to be developed. Subsequent to the EPA approval, GSR acquired SJR and with recommendations from the DFS elected not to construct the processing plant at Mpohor. This is a significant change that requires an addendum to be submitted to the original EIS document. An addendum to the EIS will be submitted in June 2007.

The Mining Lease application was submitted in April 2007 and will be issued pending EPA approval. This process is not expected to be exhaustive and it is forecast that all permits and licenses will be acquired by September 2007.

16.4.3 ENVIRONMENTAL COSTS

The primary environmental cost for HBB is the cost of closure at the end of the mine life.

The total costs for decommissioning the infrastructure and successfully rehabilitating the site are provided in Table 16-5. The EIS Addendum will include a more detailed analysis of the costs and commitments that will be required during the decommissioning phase. For the purposes of the DFS it was noted that mine closure is an important phase of mining and does have an associated cost. For the tonnage of 4.13Mt, and using the rehabilitation cost factor of $0.22/t of ore the HBB budget allowance for mine rehabilitation and mine closure equates to approximately $1M which compares well to the allowance generated in Table 16-5.

An industry rule of thumb allowance for rehabilitation is $10,000/ha. The majority of the cost in this estimate is associated with dozer time required to reshape the waste dumps to the required slopes. In the DFS, dozer time for rehabilitation has been allowed for in the mining unit cost. The reshaping of the batters will be performed as the waste dump reaches the final design limits and therefore, due to this progressive rehabilitation a contractor dozer or extra dozer hours will not be incurred. Therefore in the DFS an allowance of $7,500/ha has been used.

Table 16-5: HBB - Rehabilitation Areas

Description	Area (ha)	$M Cost @ $7,500/ha
Benso		
Subriso East Waste Dump	30	0.23
Subriso West Waste Dump	22	0.17
C Zone Waste dump	6	0.05
Workshop and Offices	12	0.09
Site Roads	4	0.03
Hwini Butre		
Main Waste Dump	51	0.38
ROM Pad and Access Roads	12	0.09
Exploration shed area	4	0.03
Total	**141**	**1.06**

The EIS Addendum will further qualify the closure requirements and associated costs so that the Environmental Bond can be estimated on the total rehabilitation costs. The bond is typically 10% cash deposit and 90% in the form of a bank guarantee, therefore the HBB bond is expected to be $105,000. No capital allowance has been made for this cost as it is covered in the project financials on an operating cost per tonne of ore basis.

16.4.4 CLOSURE PLAN

A detailed mine closure plan will developed for the EIS Addendum and will cover the following issues:

- Pit closure and wall stability;
- Waste dump rehabilitation and ARD management;
- Removal of infrastructure and scrap;
- Removal of access roads; and
- Post closure and monitoring.

Section 16.4.5 to 16.4.9 briefly discuss each of these items

16.4.5 PIT CLOSURE AND WALL STABILITY

When mining is complete at each open pit, the access to vehicles and personnel will be restricted by a combination of removing surface roads and constructing bunds around the entire pit circumference. These bunds will be a minimum of 20m from the pit crest and will be a minimum of 2m high. The pits will be allowed to fill with water from surface and ground water to provide both recreational and potential aquaculture facilities. In consultation with the local communities the pits can be stocked with local species of table quality fish and reeds and lilies to provide food and shelter for the fish. It is possible that the pits with aquaculture can be a self sustaining source of protein for the local communities.

16.4.6 WASTE DUMP REHABILITATION AND ARD MANAGEMENT

The waste dumps will be progressively rehabilitated during the HBB mine life by battering down the final dump edges to 20º slopes. The slopes will be covered with suitable materials to assist with the establishment of grasses and bushes and will be shaped and drained to minimize erosion. From preliminary testwork the waste rock to be excavated at the HBB operations is not expected to have significant ARD potential however, if further testing indicates otherwise, then a management program will be instigated to manage this ARD. The risks associated with ARD will be mitigated through engineered waste dumps that will ensure that acid generation is minimized and any drainage that may result will be contained and treated before being released to the receiving environment. The monitoring and management of a waste dump producing ARD will extend beyond mine closure.

16.4.7 REMOVAL OF INFRASTRUCTURE AND SCRAP

All infrastructure that will not be retained for community use will be removed by either relocating from the site or demolished according to the construction of the structure. Concrete and steel reinforcement will be completely removed from the surface and either buried in the waste dumps or sold as scrap depending on any potential secondary use of the products removed.

16.4.8 REMOVAL OF ACCESS ROADS

All access roads that are not required for community use will be ripped and sheeted with materials suitable for the regeneration of vegetation. These will primarily be within the mining areas. It is expected that the haulroad and most of the site access roads will remain in place post mining for community use as they can be considered a National asset.

16.4.9 POST CLOSURE MONITORING

A monitoring procedure and commitment will be required in the Environmental Management Plan ("EMP") that will demonstrate how GSR will manage the HBB site post closure. This will involve regular monitoring of ground and surface waters and evaluating the condition of the rehabilitation works. Any shortcomings will need to be addressed post closure to ensure that the HBB project does not have any long-term negative effects on the environment.

16.5 TAXES AND ROYALTIES

16.5.1 TAXES

Mining projects in Ghana are subject to the following key fiscal and tax considerations:

- The Corporate Tax rate is 25%;
- 80% of spending on exploration, mine development and mining equipment can be expensed in the first year. One half of the remaining 20% can be taken as a tax

deduction in each of the two subsequent years. Any amounts not used as a deduction in any year flow in to a capital allowance pool and remain available as a future deduction.

- Capital expenditures can be written off, up to 75% in the first year of assessment and 50% annually off the declining balance;
- All exploration and development expenditures can be capitalized;
- An investment allowance of 5% is permitted annually;
- Dividends to shareholders require 10% withholding tax to be deducted, and
- No VAT or import NHIL duties are imposed on any items purchased for the mining activity which are included on a "Mining List" agreed between the Government and mining industry. Items not on the mining list incur VAT and import NHIL duties at a rate of 15%.

16.5.2 ROYALTIES AND OTHER PAYMENTS

Under the laws of Ghana, a holder of a mining lease is required to pay an annual royalty of not less than 3% and not more than 6% of the total revenues earned from the lease area. The royalty is payable on a quarterly basis. GSR currently pays a 3% annual royalty on gold production from Bogoso/Prestea and Wassa.

Benso is subject to two additional royalties. The first is a 1.5% net smelter return royalty. This royalty can be purchased for $4.0M or for $6.0M if a feasibility study indicates more than 3,500,000oz of recoverable gold. The second royalty is $1.00/oz of gold produced. This royalty can be purchased for $0.5M. The DFS determined that these royalties will not be bought out as the ounces recovered do not justify this expense.

Hwini-Butre may be subject to two additional payments. The first is an additional $1.0M due to BD Goldfields when GSR receives all the necessary licenses, permits, approvals and consents required to mine the Hwini-Butre concession. The second potential payment is an additional contingency of $1.0M with BD Goldfields in the event that GSR produces more than 1,000,000oz of gold from the Hwini-Butre property. The DFS determined that this second payment will not be made.

16.6 CAPITAL AND OPERATING COST ESTIMATES

Using an owner mining fleet and a contractor to haul the ore to Wassa requires a capital expenditure of approximately $52M, as detailed in Table 16-6. The project startup capital is approximately $50M with the remaining being primarily sustaining capital.

In summary, this capital expenditure is required for:

- The purchase of a mining fleet;
- Construction of the 82km of haulroad;
- Wassa processing plant modifications; and
- All site establishment costs.

The capital requirement does not include any funds for the purchase of a Liebherr 994 excavator, three Cat 777 trucks and one Cat 773 water cart, as this fleet will be relocated from the existing Wassa operations. Other items which have already been purchased for the HBB operation to be utilized at Wassa until the commencement of HBB are two Atlas Copco grade control rigs and one Cat 14M grader. In order to replace the Wassa Liebherr 994 which has been identified as being too large for the later stages of the Wassa operation, the HBB operation will purchase a Liebherr 984 excavator as a replacement. Thus in the HBB capital requirement there are two Liebherr 984 excavators, one of which will be stationed at the Wassa operation as a replacement for the 994 Excavator and the other at Benso.

The accuracy of the capital estimation is relatively high with nearly 70% of the estimations coming from supplier quotations or recent experience of purchase price.

Added to the capital requirement is a 10% contingency for those sundry items that have not been allowed for and for some potential cost overruns. The two items that present the greatest risk for capital expenditure overruns are

1) Construction of the haulroad if adverse ground conditions are encountered or if the volumes have been seriously underestimated; and
2) Underestimation of the processing plant modifications and improvements that are required at Wassa and the costs of such modifications.

Table 16-6: HBB - Capital Requirements

Capital Component	Estimated Costs $ (millions)
Mining Equipment	20.6
Site Establishment	19.3
Wassa Process Plant Modifications	3.5
Sundry Items & Contingency	8.6
Total Capital Required	**52.0**

16.6.1 OPERATING COSTS

The operating costs have been empirically estimated using first principles for the life of mine. The combined average operating costs for both Hwini-Butre and Benso which were used in the optimization process are shown in Table 16-7.

The fuel price used throughout the DFS for the life of mine is $0.90/L.

One item that requires further discussion is the general and administration ("G&A") cost. As the proposed method of operation requires the HBB ore to be fed through the Wassa CIL processing plant, this effectively displaces Wassa feed, it is therefore required that the HBB ore pay a proportional amount of the G&A costs of running the Wassa operations. This currently stands at $1.70/t ore. This $1.70/t pays for Wassa's G&A but provides very little coverage for the associated costs of running the satellite operation of HBB. Therefore added to the Wassa G&A is the HBB G&A which has been estimated at $0.96/t ore, which equates to $1.1M per annum as the overhead to run the HBB operations alone. Adding these together, this equates to a G&A cost of $2.66/t milled for the HBB ore.

The ore haulage estimate per tonne per kilometer is an estimate taken from the ore haulage tender adjudication. It is expected that through negotiation with the successful contractor that this rate may be reduced. However, as there is no certainty that this will be the case $0.15/t/km has been used. The haulage distance of 65km shown in Table 16-7 is the average distance by prorating the tonnes hauled, it is not a straight numerical average of distance.

Table 16-7: HBB - Average Operating Costs

Item	Oxide	Fresh
Waste Mining ($/t mined)	1.18	1.29
Ore Mining ($/t mined)	1.51	1.64
Rehabilitation ($/t ore)	0.22	0.22
Haulage Cost ($/t/km)	0.15	0.15
Haulage Distance (km)	65	65
Total Haulage Cost ($/t ore)	9.75	9.75
G & A ($/t ore)	2.66	2.66
Process Cost ($/t ore)	5.17	6.92
Recovery (%)	92%	92%
Dilution (%)	10%	10%
Royalty (%)	3%	3%

Summarizing all of the costs used in the optimization process is Table 16-8. This table shows that the average cost of mining, hauling and processing the HBB ore is $28.95/t ore milled or a cash operating cost of $225/oz. The costs stated in the previous paragraph are the costs only for the HBB operation and are not the combined costs of the Wassa/HBB operation which were discussed previously.

Table 16-8: Operating Costs by Department

Department	Total Cost ($)	Unit Cost ($/t milled)	Unit Cost $/oz
Mining	81	$ 20	$ 153
Processing	27	$ 7	$ 52
G&A	11	$ 3	$ 21
Total	**119**	**$ 29**	**$ 225**

16.7 ECONOMIC ANALYSIS

For the $480 Mineral Reserves, the HBB project has a mine life of less than 4 years and produces 4.13Mt of ore at 4.35g/t. This project will add 531,000oz recovered to the Wassa operation at an average cost of $225/oz. The HBB project has an NPV(5%) of $56M and an IRR of 57% (Refer Table 16-10).

The HBB project is relatively insensitive to gold price; whilst lower gold prices does reduce the cashflow generated from the project significantly it still has a positive NPV down to gold prices lower than $400/oz (Table 16-9). Conversely increased gold prices makes the project very attractive, with an increase in gold price from $480/oz to $560/oz the project NPV is increased by 64% to $92.6M with an IRR of 85%.

Table 16-9: HBB - $480/oz sensitivity to gold price.

	Gold Price US$/oz				
	$ 400	**$ 440**	**$ 480**	**$ 520**	**$ 560**
NPV (5%) ($M)	$24	$41	$56	$75	$93
% Change from $480/oz	-58%	-28%	0%	33%	64%
IRR	28%	44%	57%	72%	85%

The project is most sensitive to revenue, which can be affected by gold price and/ or process recovery. It can be seen in Table 16-11 and Table 16-12 that a 10% reduction in revenue results in a 36% reduction in NPV(5%). The project is next most sensitive to capital expenditure where a 10% increase in capital results in a reduction to the NPV(5%) of almost 9%.

Increases in mining and haulage costs has a similar effect where an increase in the costs by 10% results in a decrease in NPV(5%) of 6%. The project is least sensitive to process and G&A costs.

Table 16-10: HBB - $480/oz Production Forecast and Cashflow

Financial Summary		Totals	2007	2008	2009	2010	2011	2012
PRODUCTION - Benso								
Total Tonnes Mined	t	**12,971,505**	0	1,615,209	3,946,238	3,979,430	3,430,628	0
Ore Tonnes Mined	t	**2,298,896**	0	127,156	590,621	890,666	690,453	0
Ore Grade Mined	g/t	**3.41**	-	3.50	4.06	3.08	3.28	-
Strip Ratio	t/t	**4.6**	-	11.7	5.7	3.5	4.0	-
PRODUCTION - Hwini Butre								
Total Tonnes Mined	t	**18,163,677**	0	2,644,197	6,242,928	7,193,177	2,083,376	0
Ore Tonnes Mined	t	**1,826,489**	0	366,141	674,564	536,706	249,078	0
Ore Grade Mined	g/t	**5.52**	-	4.62	5.73	5.65	6.01	-
Strip Ratio	t/t	**8.9**	-	6.2	8.3	12.4	7.4	-
PRODUCTION - Total								
Total Tonnes Mined	**t**	**31,135,182**	**0**	**4,259,406**	**10,189,165**	**11,172,607**	**5,514,004**	**0**
Ore Tonnes Mined	**t**	**4,125,385**	**0**	**493,297**	**1,265,185**	**1,427,371**	**939,531**	**0**
Ore Grade Mined	**g/t**	**4.35**	**-**	**4.33**	**4.95**	**4.05**	**4.01**	**-**
Strip Ratio	**t/t**	**6.5**	**-**	**7.6**	**7.1**	**6.8**	**4.9**	**-**
Material Type Mined								
Oxide %	%	**27%**	0%	80%	31%	10%	14%	0%
Fresh %	%	**73%**	0%	20%	69%	90%	86%	0%
Tonnes Milled								
Oxide Ore	t	**674,027**	-	324,068	153,259	125,681	61,966	9,053
Oxide Ore Grade	g/t	**4.10**	-	3.62	6.14	3.73	2.61	1.86
Fresh Ore	t	**3,451,359**	-	169,229	1,047,661	1,074,455	1,138,070	21,942
Fresh Ore Grade	g/t	**4.40**	-	5.68	4.85	4.27	3.94	2.66
Total Ore Tonnes Milled	**t**	**4,125,385**	**-**	**493,297**	**1,200,920**	**1,200,136**	**1,200,036**	**30,995**
Grade Milled	**g/t**	**4.35**	**-**	**4.33**	**5.01**	**4.21**	**3.88**	**2.42**
Gold	gm	**17,937,080**	-	2,136,596	6,018,993	5,055,139	4,651,199	75,153
Recovery	%	**92.1%**	0.0%	91.8%	92.0%	92.0%	92.4%	92.8%
Gold Recovered From Ore	oz	**531,082**	-	63,062	178,020	149,591	138,166	2,242
Gold Price	$/oz	**$ 480**	$ 480	$ 480	$ 480	$ 480	$ 480	$ 480
UNIT COSTS								
Cash Operating Cost	$/oz	**$ 225**	$ -	$ 237	$ 207	$ 252	$ 212	$ 233
Production Costs	$/oz	**$ 243**	$ -	$ 253	$ 225	$ 270	$ 232	$ 256
Total Costs	$/oz	**$ 342**	$ -	$ 295	$ 310	$ 364	$ 331	$ 3,558
Hwini Butre Benso Cost	$/t mined	**$ 2.60**	$ -	$ 2.53	$ 2.52	$ 2.37	$ 3.26	$ -
Mining Cost	$/t ore mined	**$ 19.65**	$ -	$ 21.81	$ 20.26	$ 18.56	$ 19.13	$ -
Milling Cost	$/t milled	**$ 6.64**	$ -	$ 5.78	$ 6.70	$ 6.74	$ 6.82	$ 6.39
G&A Costs	$/t milled	**$ 2.66**	-	$ 2.66	$ 2.66	$ 2.66	$ 2.66	$ 2.66
PROFIT AND LOSS								
Revenue								
Gold Revenue	US$'000	**$ 254,919**	$ -	$ 30,270	$ 85,450	$ 71,804	$ 66,320	$ 1,076
Total Revenue	**US$'000**	**$ 254,919**	**$ -**	**$ 30,270**	**$ 85,450**	**$ 71,804**	**$ 66,320**	**$ 1,076**
Operating Costs								
Mining	US$'000	**-$ 81,084**	$ -	-$ 10,757	-$ 25,629	-$ 26,485	-$ 17,971	-$ 242
Processing	US$'000	**-$ 27,373**	$ -	-$ 2,849	-$ 8,051	-$ 8,089	-$ 8,186	-$ 198
G&A	US$'000	**-$ 10,974**	$ -	-$ 1,312	-$ 3,194	-$ 3,192	-$ 3,192	-$ 82
Cash Cost	**US$'000**	**-$ 119,431**	**$ -**	**-$ 14,918**	**-$ 36,875**	**-$ 37,766**	**-$ 29,349**	**-$ 522**
less Government Royalty (3%)	US$'000	**-$ 7,648**	$ -	-$ 908	-$ 2,563	-$ 2,154	-$ 1,990	-$ 32
less Benso Royalty (1.5% + $1/oz)	US$'000	**-$ 1,920**	$ -	-$ 109	-$ 530	-$ 492	-$ 771	-$ 18
Total Cash Cost	**US$'000**	**-$ 128,999**	**$ -**	**-$ 15,935**	**-$ 39,968**	**-$ 40,413**	**-$ 32,110**	**-$ 573**
EBITDA	**US$'000**	**$ 125,920**	**$ -**	**$ 14,334**	**$ 45,481**	**$ 31,391**	**$ 34,209**	**$ 503**
Rehabilitation Provision	US$'000	**-$ 908**	$ -	-$ 109	-$ 278	-$ 314	-$ 207	$ -
Environmental bonding	US$'000	**$ -**						
Depreciation of Development Costs (UOP¹)	US$'000	**-$ 24,421**	$ -	$ -	-$ 9,091	-$ 7,701	-$ 7,113	-$ 515
Depreciation of Equipment & Assets (SL²)	US$'000	**-$ 27,528**	$ -	-$ 2,573	-$ 5,789	-$ 5,989	-$ 6,289	-$ 6,889
Total Charges	US$'000	**-$ 52,857**	$ -	-$ 2,682	-$ 15,158	-$ 14,004	-$ 13,608	-$ 7,404
EBT	**US$'000**	$ 73,063	**$ -**	**$ 11,653**	**$ 30,323**	**$ 17,387**	**$ 20,601**	**-$ 6,901**
PROJECT CASHFLOW								
Tax @ 0%	**US$'000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Project Cashflow								
Project Development	US$'000	**-$ 24,421**	-$ 11,644	-$ 12,257	-$ 120	$ -	$ -	-$ 400
Project Equipment & Assets	US$'000	**-$ 27,528**	-$ 12,867	-$ 12,862	-$ 600	-$ 600	-$ 600	$ -
Total Capital	**US$'000**	**-$ 51,949**	**-$ 24,511**	**-$ 25,118**	**-$ 720**	**-$ 600**	**-$ 600**	**-$ 400**
Project Cashflow	**US$'000**	$ 73,063	**-$ 24,511**	**-$ 10,892**	**$ 44,483**	**$ 30,477**	**$ 33,403**	**$ 103**
Cumulative Cashflow	**US$'000**		**-$ 24,511**	**-$ 35,403**	**$ 9,080**	**$ 39,557**	**$ 72,960**	**$ 73,063**
NPV @ 5%	**US$'000**	$ 56,526	**$56,526**	**$83,863**	**$98,948**	**$59,413**	**$31,906**	**$98**
IRR		57%						

1: UOP = Dep'n over Units of Production
2: SL = Straight Line Depreciation

Table 16-11: HBB - NPV(5%) ($480/oz) Sensitivity ($M)

	-10%	-5%	0	5%	10%
Mining Cost	$62	$59	$56	$54	$51
Process Cost	$60	$58	$56	$55	$53
Haulage Cost	$62	$59	$56	$54	$51
G&A	$58	$57	$56	$56	$55
Gold Price	$22	$39	$56	$74	$91
Capex	$65	$61	$56	$53	$49

Table 16-12: HBB - ($480/oz) Percentage Change on NPV(5%)

	-10%	-5%	0%	5%	10%
Mining Cost	6.0%	3.0%	0.0%	-3.0%	-6.0%
Process Cost	4.0%	2.0%	0.0%	-2.0%	-4.0%
Haulage Cost	6.0%	3.0%	0.0%	-3.0%	-6.0%
G&A	1.6%	0.8%	0.0%	-0.8%	-1.6%
Gold Price	-36.3%	-18.1%	0.0%	18.1%	36.3%
Capex	8.5%	4.2%	0.0%	-4.2%	-8.5%

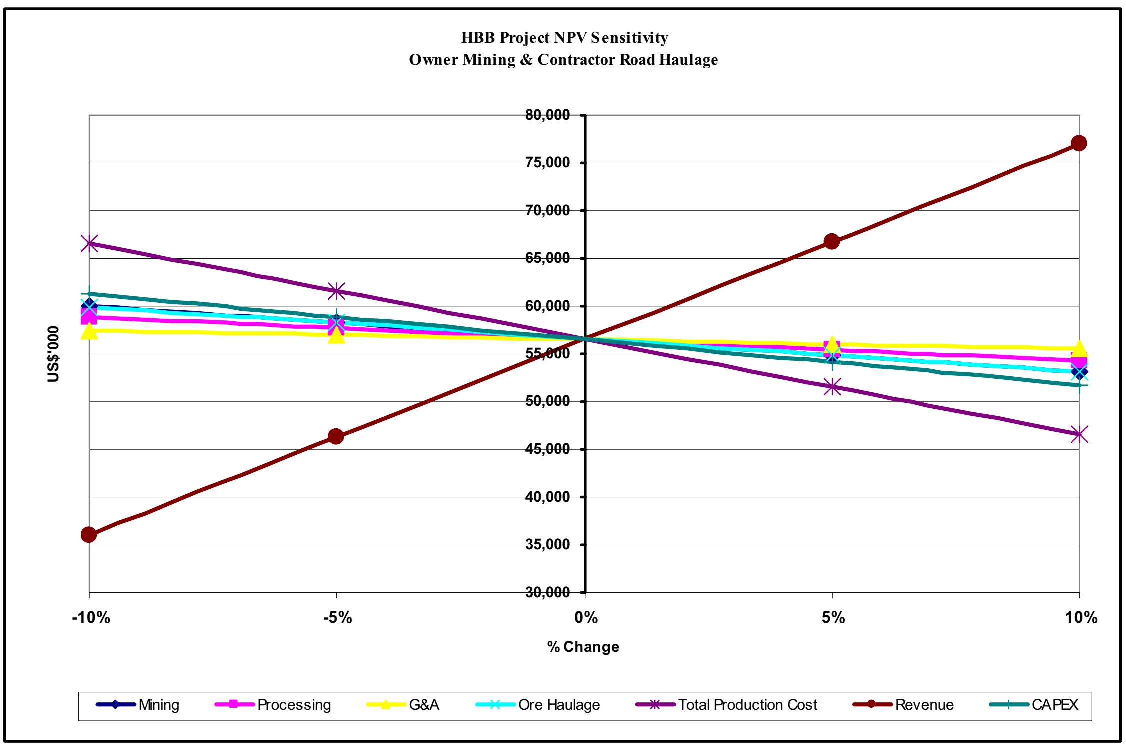


Figure 16-2: HBB - $480/oz Project Sensitivity

The $480/oz "Reserve Case" presented in this Technical Report is consistent with GSR's Mineral Reserve disclosure as at December 31, 2006 and reported in February 2007. Mineral Reserves were estimated at that time using a $480/oz gold price which approximated the three-year average gold price (London Fix) as at December 31, 2006. Thus for the Reserve Case pit optimizations, mine design, schedules, economic evaluations and Mineral Reserve estimates were all conducted using only Measured and Indicated Mineral Resources and a $480/oz gold price.

In recognition of recent gold price trends a "Business Case" was developed in the DFS. The gold price averages for 2005, 2006 and 2007 (end of March) are approximately $445/oz, $604/oz and $650/oz respectively. While forecasting gold prices is speculative in nature there is a reasonable expectation that if gold prices average in the range of $585/oz to $665/oz for 2007 the three-year average price at year end could be of the order of $560/oz ± $10. Mining on the HBB properties is planned to commence in 2008. Hence a Business Case has been developed based on Mineral Reserves estimated using a $560/oz gold price. Only Measured and Indicated Mineral Resources are used in this Business Case and similar engineering parameters have been applied as per the $480/oz Reserve Case in developing the pit designs.

For the revenue models developed for the Business Case a gold price of $600/oz was used for estimating revenue. It is noted that a gold price of $600/oz is consistent with GSR's 2007 operating budget models.

The Business Case is the most likely scenario that the HBB project will operate under. The DFS financial analysis estimated the Business Case has an NPV(5%) of $100M and an IRR of 74%. The Business Case produces 4.7Mt at 4.06g/t for 565,300oz recovered at an average cash operating cost of $256/oz.

16.8 PAYBACK

Due to the relatively high grades of the HBB project, the payback of capital expenditure is approximately nine months after the first ore is processed from this operation. The project has a positive cashflow at the end of Qtr 1, 2009.

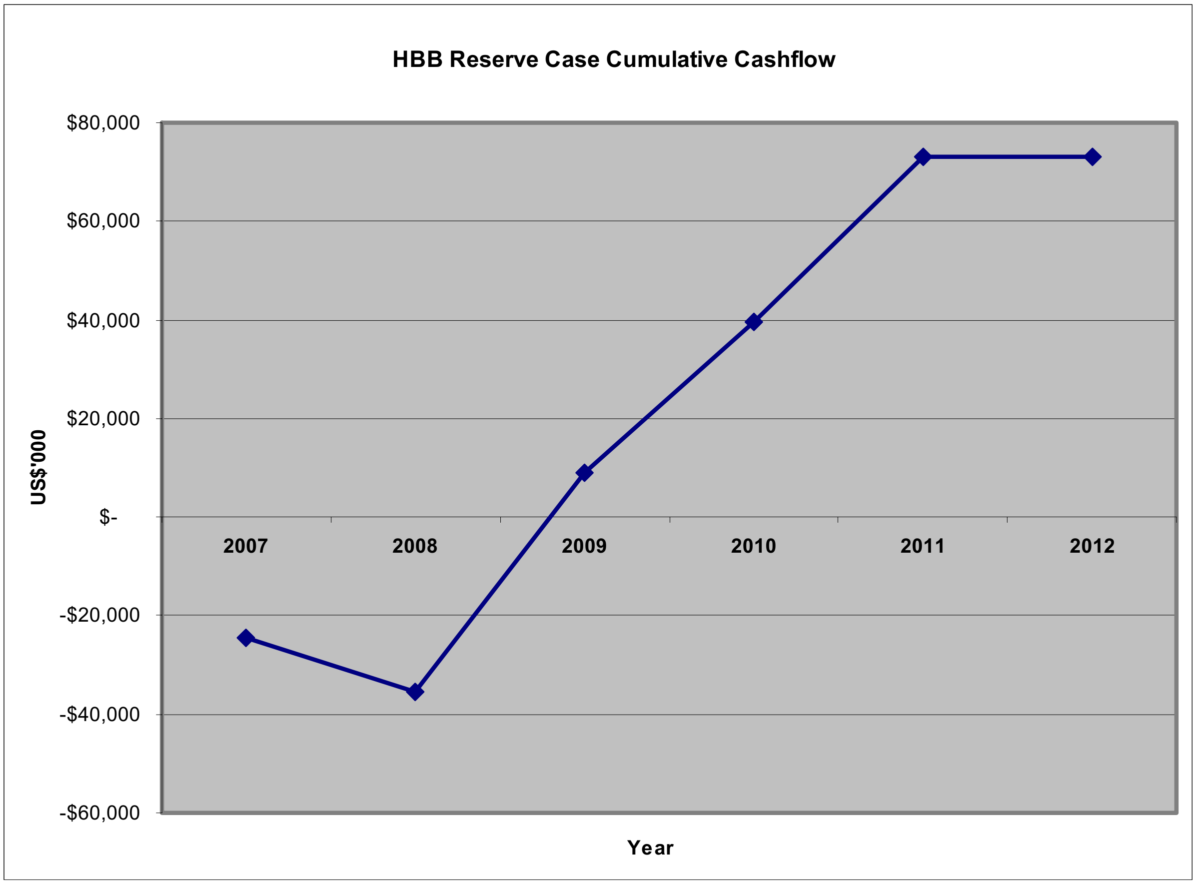


Figure 16-3: HBB - $480/oz Reserve Case Cashflow

16.9 MINE LIFE

The HBB $480/oz Reserve Case provides approximately one year of additional mine life to the Wassa operation; that is assuming that the HBB project produces ore at an average rate of approximately 1.2Mtpa. Therefore the HBB satellite operation will have a mine life of approximately four years. As mentioned in Section 12.0 the HBB concessions and the surrounding prospecting leases owned by GSR are very prospective and with the existing exploration program there is a very high potential for the life of the HBB project to be increased as Mineral Resources get converted to Mineral Reserves and as new prospects and targets are further defined.

16.10 INTERPRETATIONS AND CONCLUSIONS

The following conclusions were stated in the SRK report *Mineral Resource Estimation of the Benso and Hwini-Butre prospects, South West Ghana, January 2007*. (Reference 1)

- The majority of the data used for the current Mineral Resource estimate is based on sampling carried out by St Jude Resources as part of their extensive, five year exploration campaign.
- GSR have carried out a detailed due diligence exercise as part of their purchase of SJR and have also initiated a confirmation and infill drilling campaign at both the Benso and Hwini-Butre prospects. To date, only the Dabokrom orebody has not been redrilled by GSR.
- QAQC information is available from SJR drilling in addition to that carried out by GSR as part of their 2006 drilling campaign. GSR have also re-submitted samples originally taken by SJR to the Transworld Laboratory in Ghana. Overall the QAQC results are good and confirm the quality of the drilling and sampling carried out by SJR. However, the inclusion by SJR of many low grade samples in their QAQC database is not providing an accurate representation of the sampling within the mineralized zones. The GSR work has concentrated on samples from within the mineralized zones and are more likely to be representative of possible mining material.
- Gold grade distribution at Hwini-Butre appears to be more variable than at Benso. However, at both prospects, the statistical analysis is suggesting a break at around 4-5g/t which may be indicative of a bimodal distribution and/or multiple phases of mineralization.
- The statistical analysis and the QAQC work is also suggesting the higher grade samples are not being accurately reported by the assay procedure and this is seen in the poor quality of the results from assay of the higher grade standards (+4g/t). It is therefore recommended that additional checks be carried out on the samples and standards submitted within these grade categories.
- SRK do not consider the current prospects to be sufficiently understood or sampled to a sufficient level of confidence to allow the categorization of a Measured Mineral Resource and those deposits which rely entirely upon SJR data are currently classified as Inferred Mineral Resource.

17.0 RECOMMENDATIONS

Now that the DFS is complete and the GSR Board has approved the HBB project there are various tasks that must be completed before construction and mine development can commence.

The following bullet items are in order of priority and have been discussed in detail in the text of this Technical Report. The cost for this work has been included in the HBB project capital cost estimate.

- Mining Lease application and award;
- EPA Addendum and subsequent granting of EPA permit;
- Forestry approvals;
- Continue the ARD testwork;
- Drill boreholes at Benso for groundwater evaluation; and
- Conduct a backwater design on the final waste dump designs at Benso.

18.0 REFERENCES

1. SRK Consulting (UK) Ltd. Dr John Arthur. January 2007, Mineral Resource Estimation of the Benso and Hwini-Butre prospects, South West Ghana.
2. SRK Consulting (UK) Ltd. Neil Marshall January 2007, Hwini-Butre and Benso Deposits Open Pit Slope Design Report
3. SRK Consulting (UK) Ltd. Ben Green and Ryan Males. March 2007, Benso Gold Mine: Hydrogeology and Hydrology Studies.
4. John W. MacIntyre & Associates Pty Ltd, April 2007, Hwini-Butre and Benso Metallurgy Report (Revision 3).
5. Nakton Ghana Limited, October 2005. St Jude Resources, Mpohor Gold Mining Project Environmental Impact Statements EIS (Final)
6. SGS Environment, Ghana, April 2007, Hwini-Butre and Benso Road Project, Environmental and Socio-Economic Baseline Report.
7. SGS Environment, Ghana, February 2007, Hwini-Butre and Benso Project, Environmental and Socio-Economic Baseline Report.
8. Watts, Griffis and Mc Quat Limited, February 2002, Geology and Mineral Resources of the Hwini-Butre Concession, Ghana for St. Jude Resources Ltd.

19.0 ILLUSTRATIONS

Table 19-1: GSR - Concession Boundary Coordinates

Property Names	ID	East (GNG*)	North (GNG*)	East (UTM)	North (UTM)
Hwini-Butre	p1	181198.88	49348.87	628601.88	565559.05
	p2	181197.88	49010.88	628601.94	565221.08
	p3	178179.87	49014.88	625584.15	565215.69
	p4	178156.88	31692.87	625614.2	547895.07
	p5	177170.88	31663.87	624628.38	547863.09
	p6	177169.88	30680.87	624630.34	546880.18
	p7	176153.87	30681.87	623614.42	546878.12
	p8	176182.88	29667.87	623646.47	545864.31
	p9	175412.88	29699.87	622876.45	545893.99
	p10	175421.87	36671.88	622864.37	552865.34
	p11	176900.87	36669.88	624343.23	552867.84
	p12	176908.87	42658.88	624332.92	558856.32
	p13	175399.88	42660.88	622824.06	558853.68
	p14	175403.88	46131.87	622817.35	562324.34
	p15	176543.88	46129.87	623957.25	562325.87
	p16	176547.88	49354.87	623951.24	565550.58
	p17	181198.88	49348.87	628601.88	565559.05
Chichiwilli	p1	186564.25	65171.37	633917.05	581397.64
	p2	185793.62	64589.49	633148.31	580813.33
	p3	183246.5	65134.25	630599.58	581349.92
	p4	185886	69165.75	633226	585389.69
	p5	188940.5	69165	636280.4	585398.77
	p6	189217.88	68231.88	636560.78	584466.56
Subriso (Benso)	p1	177347.37	56005	624729.85	572202.61
	p2	175564.88	54563.87	622952.05	570756
	p3	173681.88	55356.25	621066.76	571542.38
	p4	173680.87	59398.88	621052.99	575584.57
	p5	174805	59467.87	622176.79	575657.12
	p6	174808.62	61184.5	622174.96	577373.59
	p7	177354.5	61167.37	624720.65	577364.54
	p8	177649	58876.5	625022.39	575074.81

Property Names	ID	East (GNG*)	North (GNG*)	East (UTM)	North (UTM)
Amantin	p1	178456.75	52917	625848.83	569118.35
	p2	180655	54080.5	628043.26	570288.66
	p3	180655.25	49380.62	628058.19	565589.11
	p4	178429	49384	625832.11	565585.56
Manso 1	p1	181620.99	54660.98	628983.17	570529.46
	p2	183923.1	53913.23	631287.46	569788.95
	p3	183883.72	29259.34	631323.72	545135.38
	p4	177507.12	29267.42	624947.65	545124.32
	p5	177505.07	27701.16	624950.29	543558.13
	p6	170727.77	27710.32	618173.79	543547.02
	p7	170731.22	30167.33	618169.87	546003.82
	p8	172055.9	30165.48	619494.37	546005.95
	p9	172059.52	32776.07	619490.13	548616.33
	p10	175447.89	32771.43	622878.1	548621.92
	p11	175443.8	29730.88	622883.17	545581.56
	p12	176183.17	29729.89	623622.44	545582.79
	p13	176184.43	30681.97	623620.85	546534.81
	p14	177170.18	30680.66	624606.5	546536.47
	p15	177171.53	31694.21	624604.78	547549.97
	p16	178188.1	31692.88	625621.26	547551.7
	p17	178196.2	37866.04	625610.66	553724.59
	p18	179151.07	37895.52	626565.35	553756.98
	p19	179182.31	38294.73	626595.36	554156.26
	p20	181184.43	38292.14	628597.31	554159.78
	p21	181188.02	41086.98	628592.35	556954.54
	p22	179309.24	41058.68	626713.82	556920.49
	p23	179315.52	45819.16	626705.45	561680.78
	p24	181255.77	45816.62	628645.55	561684.24
	p25	181260.42	49379.22	628639.14	565246.75
	p26	180675.26	49379.99	628054.03	565245.69
	p27	180648.26	54122.37	628012.21	569987.82
Manso 2	p1	178456.7	52917.16	625824.64	568775.79
	p2	178429.77	49384.19	625808.73	565242.91
	p3	176866.55	49397.48	624245.64	565251.32
	p4	177684.33	51940.26	625055.39	567796.52
	p5	177130.42	52161.15	624500.86	568015.67

* GNG = Ghana National Grid

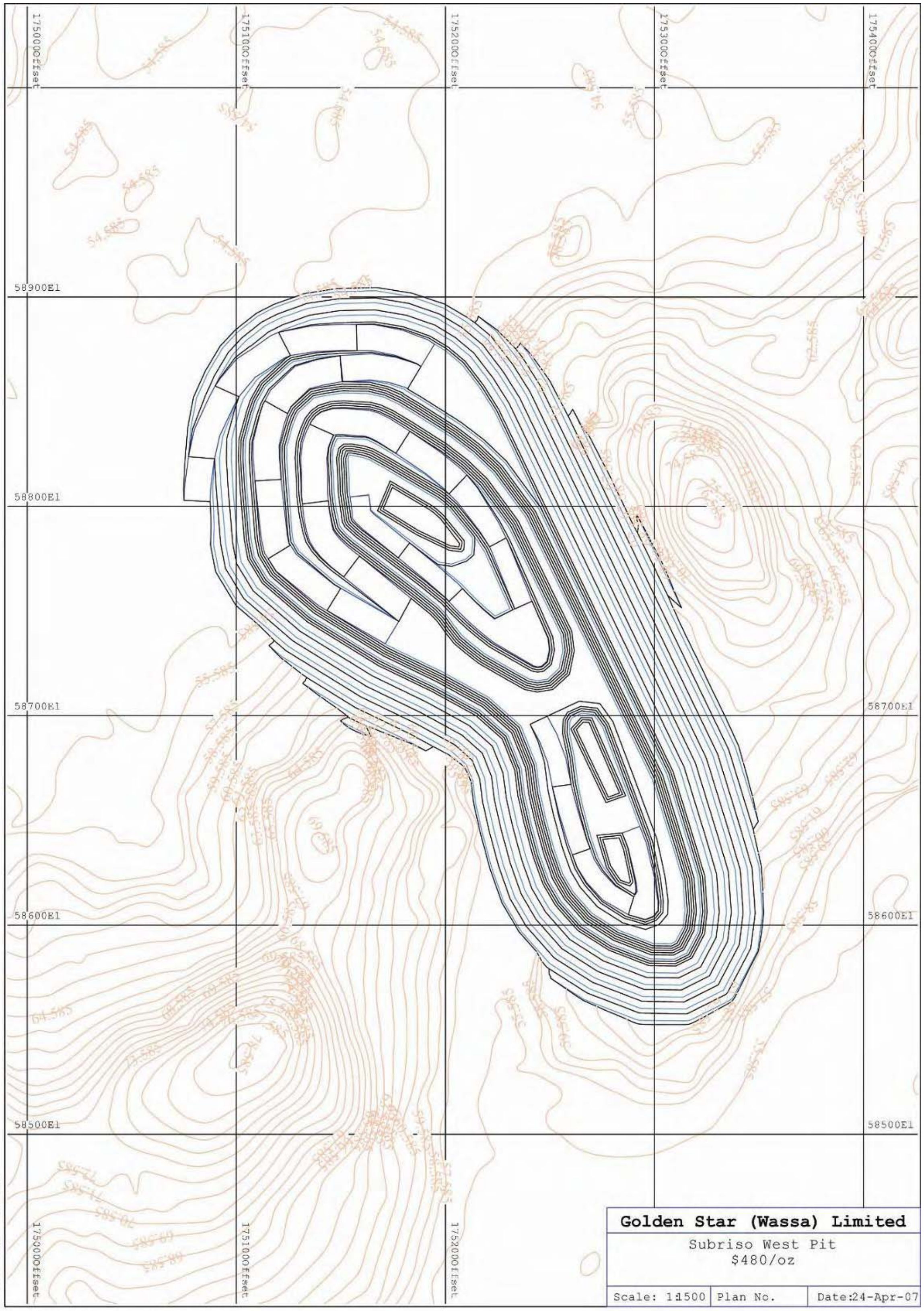


Figure 19-1: HBB - Subriso West Pit - $480/oz

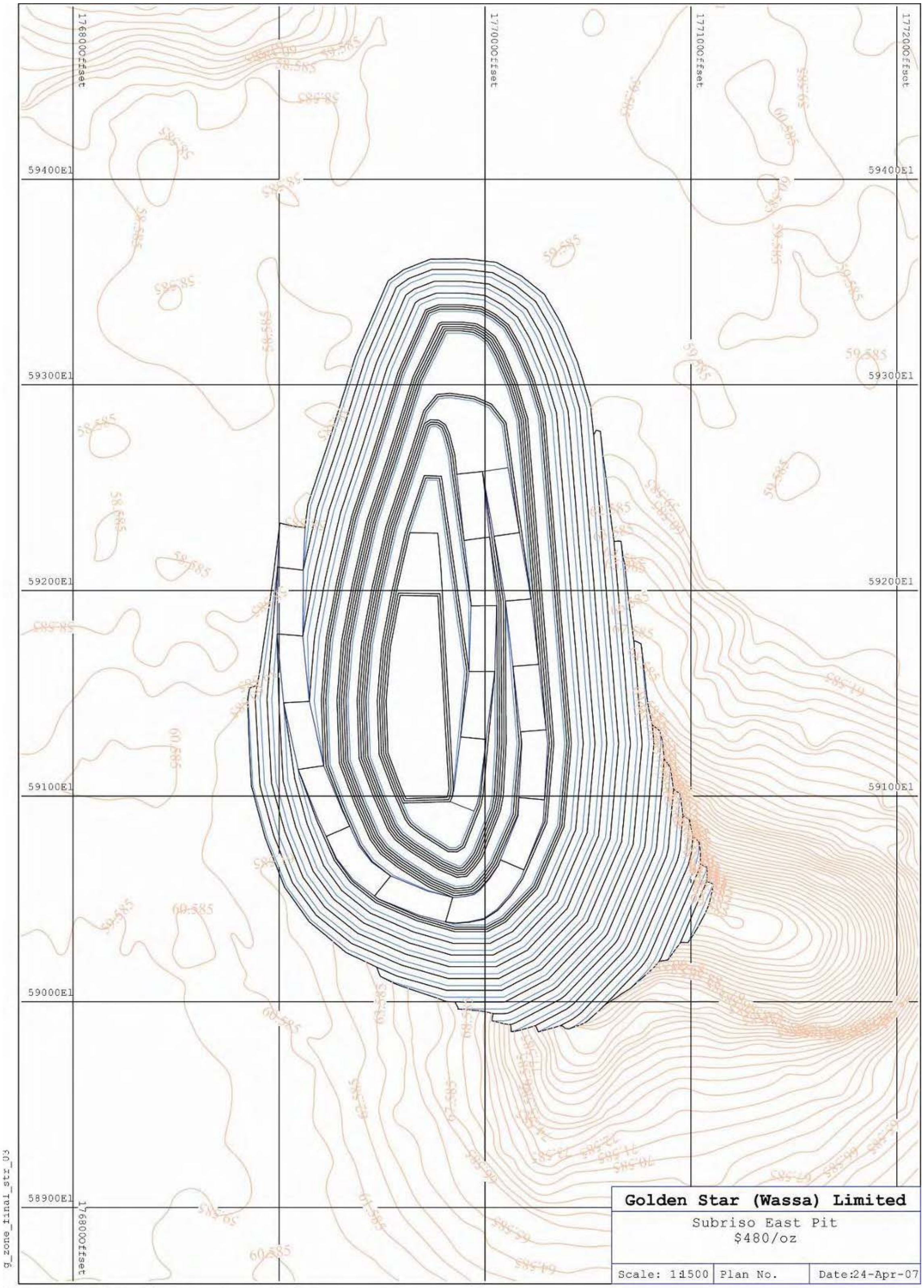


Figure 19-2: HBB - Subriso East Pit - $480/oz

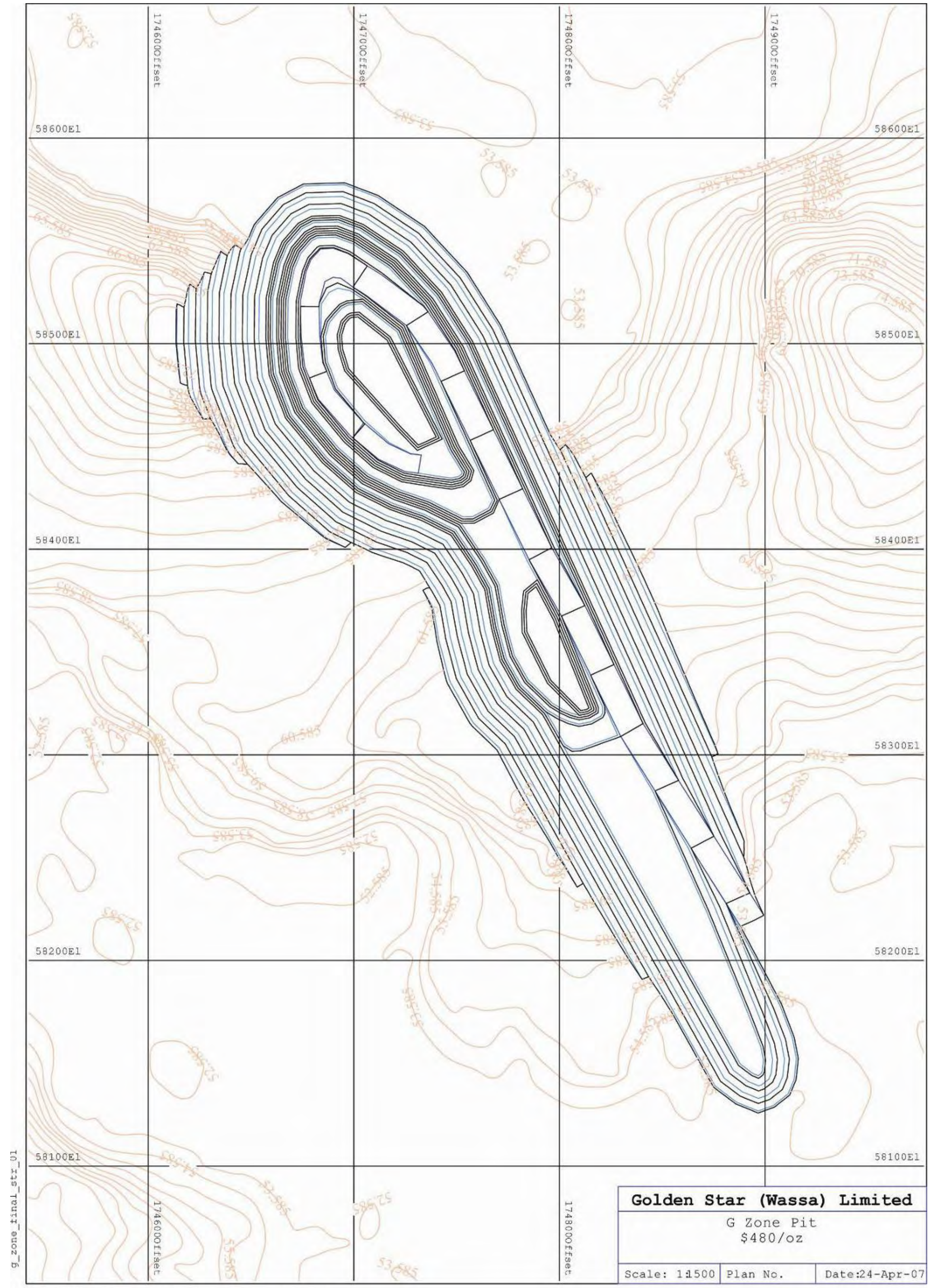


Figure 19-3 HBB - G-Zone Pit - $480/oz

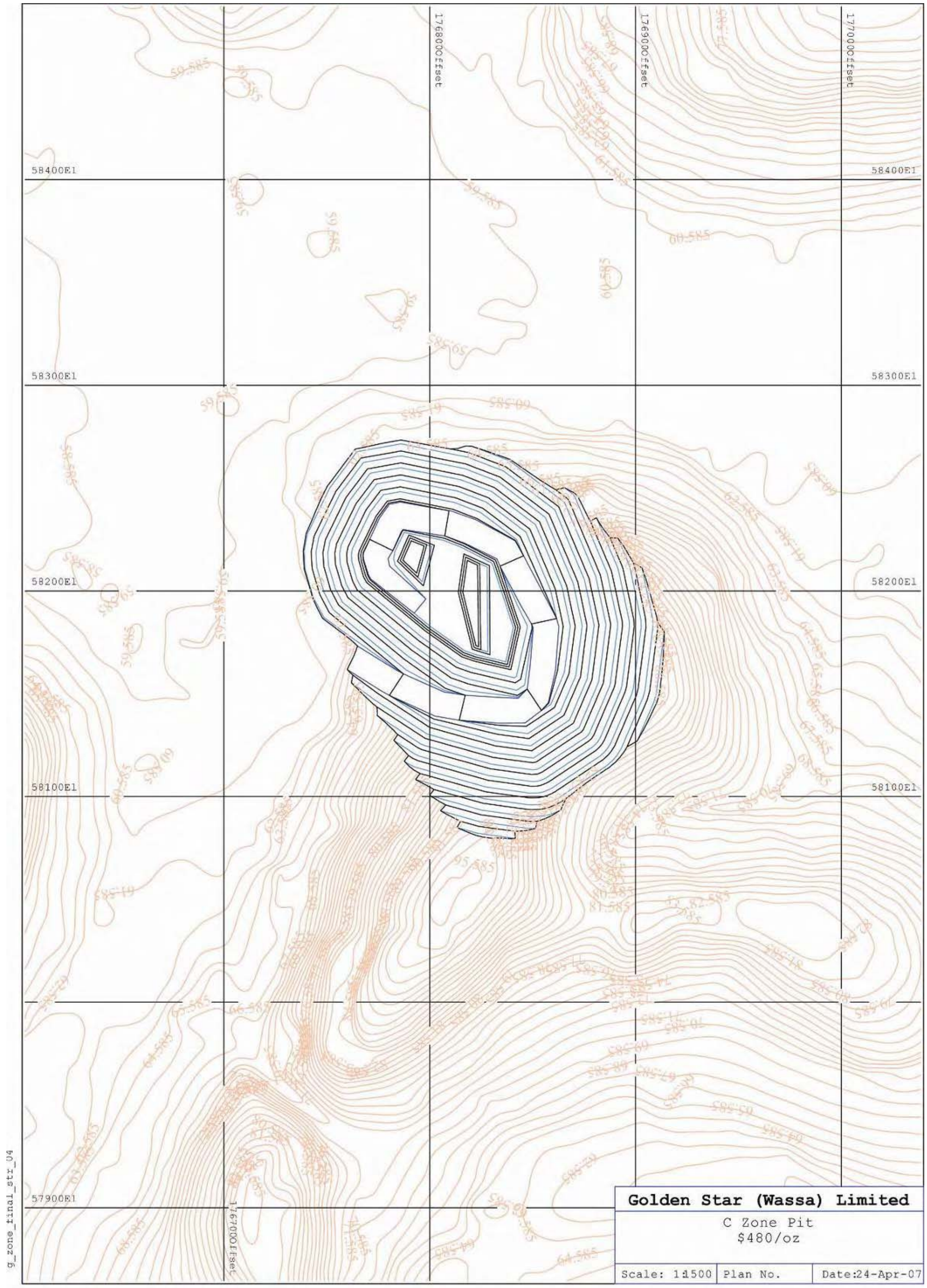


Figure 19-4: HBB - C-Zone Pit - $480/oz

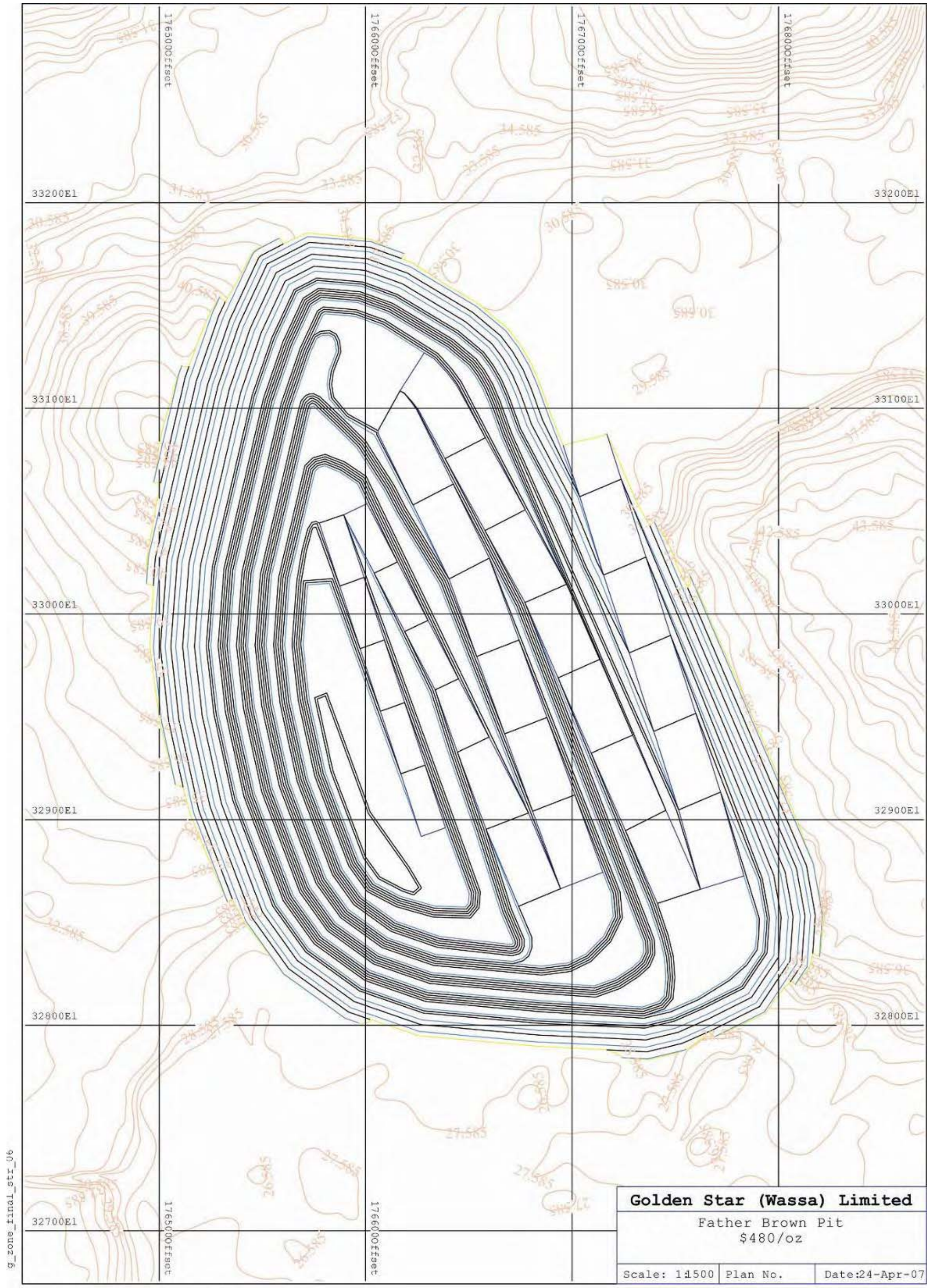


Figure 19-5: HBB - Father Brown Pit - $480/oz

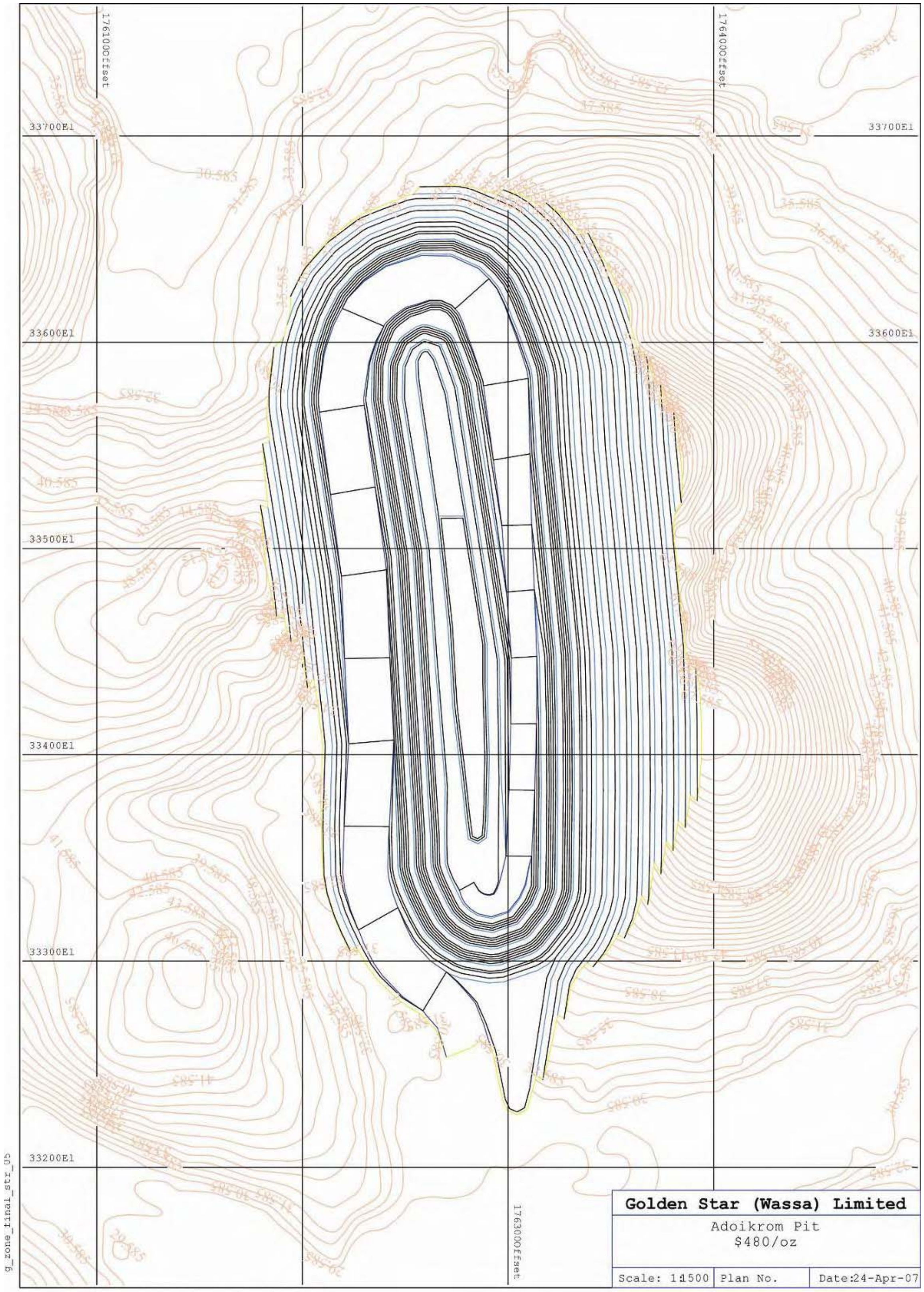


Figure 19-6: HBB - Adoikrom Pit - $480/oz

20.0 AUTHORS CONSENT FORMS

Certificate

To accompany the Technical Report dated June 15, 2007, entitled "First Time Disclosure of Mineral Reserves, Hwini-Butre and Benso Properties, Southwest Ghana" (the "Technical Report").

I, Peter Bourke, P.Eng, MAusIMM, residing at 5 Rosehill Ave, Toronto, Ontario, that:

1. I am a professional mining engineer employed as Vice President Technical Services for Golden Star Resources Ltd. ("GSR").
2. I am a licensed Professional Engineer in the Provinces of Ontario (#100107956) and British Columbia (#25009), Canada. I am also a Member of the Australasian Institute of Mining and Metallurgy (#104191).
3. I have worked as a mining engineer in the mining industry continuously since 1985. By reason of my education and past relevant work experience I fulfill the requirements of a Qualified Person as defined by National Instrument 43-101 (December 2005) ("NI 43-101").
4. The date of my last personal inspection of the Hwini-Butre and Benso properties is December 5, 2006. The date of my last personal inspection of the Wassa operation is April 16-17, 2007.
5. I have had overall responsibility for supervision of the preparation of this Technical Report.
6. During my employ with GSR, I have been involved with the preparation of the Detailed Feasibility Study for Hwini-Butre and Benso by GSR and its consultants. Prior to my employment with GSR I have had no involvement with the properties.
7. I am an employee of GSR and hence not independent as defined in Section 1.4 of NI 43-101.
8. I have read NI 43-101 and CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005). The work that I performed for this Technical Report is in compliance with NI 43-101, and conforms with generally accepted mining industry practices.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated ___15th June 2007

Certificate

To accompany the Technical Report dated June 15, 2007, entitled "First Time Disclosure of Mineral Reserves, Hwini-Butre and Benso Properties, Southwest Ghana" (the "Technical Report")

I, Steven Mitchel Wasel, MAusIMM, residing at 17 Whin River Road, Takoradi, Ghana that:

1. I am a qualified geologist employed as Exploration Manager for Golden Star Resources Ltd.
2. I am an active *Member of the AusIMM, membership # 209098*
3. I have worked/practiced as a geologist in the exploration and mining industry since 1988 for 19 years and am therefore a Qualified Person as defined by NI 43-101 (December 2005) ("NI 43-101").
4. The date of my last personal inspection of the Hwini-Butre properties was May 2007.
5. I have had responsibility for checking and validating the resource estimate portion of this Technical Report and for the reported Mineral Resources. I have been directly involved with the supervision of exploration on the project since January 2006.
6. I am an employee of Golden Star Resources and hence am not independent as defined in Section 1.4 of NI 43-101.
7. I have read NI 43-101 and CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005). The work that I performed for this Technical Report is in compliance with NI43-101, and conforms with generally accepted mining industry practices.
8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signature STEVEN MITCHELL WASEL

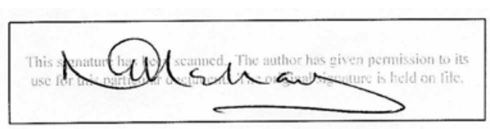
Date June 12, 2007

Certificate

To accompany the Technical Report dated June 15, 2007, entitled “First Time Disclosure of Mineral Reserves, Hwini-Butre and Benso Properties, Southwest Ghana” (the “technical Report”).

I, Neil Marshall CEng MSc (DIC) BSc, residing at 4 Pentwyn, Radyr, Cardiff, CF15 8RE, UK, certify that:

1. I am a geotechnical/rock mechanics engineer employed as Principal Geotechnical Engineer for SRK Consulting (UK) Ltd.
2. I am a UK Chartered Engineer, a member of the UK Institution of Minerals, Mining and Materials (IMMM), a member of the British Geotechnical Association (BGA) and a member of the International Society of Rock Mechanics (ISRM).
3. I have worked/practiced as a geotechnical engineer in the mining industry since 1979. By reason of my education and past relevant work experience I fulfill the requirements of a Qualified Person as defined by NI 43-101 (December 2005) (“NI 43-101”).
4. The date of my last personal inspection of the Hwini-Butre and Benso properties is December 2006
5. I designed the geotechnical drilling and testing program for the properties, developed the geotechnical models for the deposits and under took the analytical work leading to the recommendations of design slope angles in this Technical Report.
6. I am an independent Qualified Person as defined in Section 1.4 of NI 43-101.
7. I have read NI 43-101 and CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005). The work that I performed for this Report is in compliance with NI 43-101, and conforms with generally accepted mining industry practices.
8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signature _ 

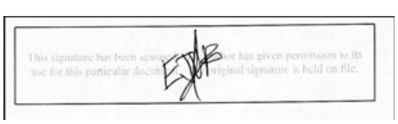
Date ____June 13th 2007_____

Certificate

To accompany the Technical Report dated June 15, 2007, entitled "First Time Disclosure of Mineral Reserves, Hwini-Butre and Benso Properties, Southwest Ghana" (the "Technical Report").

I, Edgar Urbaez, MAusIMM, residing in Cardiff, UK, that:

1. I am a professional mining engineer trading as an independent consultant in PO Box 826, Cardiff, CF11 1GL, UK.
2. I graduated with a degree in Mining from Colorado School of Mines, USA, in 1995. In addition, I have obtained a Masters degree (M.Sc) in Mining from Colorado School of Mines, USA, in 1998.
3. I am a Member of the Australasian Institute of Mining and Metallurgy, Australia (224172). I am also a Founding Registered Member of the Society for Mining, Metallurgy, and Exploration, USA (4028399RM).
4. I have worked as a mining engineer in the mining industry continuously since 1997. By reason of my education and past relevant work experience I fulfil the requirements of a Qualified Person as defined by NI 43-101 (December 2005) ("NI 43-101").
5. I personally inspected the Hwini-Butre and Benso properties in January 2007.
6. I have had responsibility for preparation of pit optimizations and pit designs for the Hwini-Butre and Benso deposits. Additionally, I have assisted Golden Star Resources with the preparation of estimates of Mineral Reserves for the Hwini-Butre and Benso deposits, for this Technical Report.
7. I am not an employee of Golden Star Resources and hence am an independent Qualified Person as defined in Section 1.4 of NI 43-101.
8. I have read NI 43-101 and CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005). The work that I performed for this Technical Report is in compliance with NI 43-101, and conforms with generally accepted mining industry practices.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.



Signature ______________________ Date _____June 6th, 2007_____________

Certificate

To accompany the Report dated June 15, 2007, entitled "First Time Disclosure of Mineral Reserves, Hwini-Butre and Benso properties, Southwest Ghana" (the "Technical Report")

I, John W MacIntyre, residing at 29 Naval Parade, Ocean Reef, 6027, Australia, certify that:

1. I hold a Bachelor of Science Degree (Metallurgy) from the University of Queensland (1975) and work as a Consulting Metallurgist for my own company John W MacIntyre & Associates Pty. Ltd.
2. I am a Fellow Member of the Australian Institute of Mining Metallurgy.
3. I have worked/practiced as a Metallurgist in the mining industry since 1975 for more than 32 years. I am a Qualified Person as defined by NI 43-101 (December 2005).
4. I have not conducted a personal inspection of the HBB properties nor have I inspected the Wassa plant.
5. I have had overall responsibility for preparation of the report entitled "Hwini-Butre and Benso Metallurgy Report (Revision 3)" including estimation of processing costs and metallurgical recoveries and cited as Reference 4 in this Technical Report. I have not had any previous involvement with the project prior to the compilation of this Technical Report.
6. I am not an employee of Golden Star Resources and hence am an independent Qualified Person as defined in Section 1.4 of NI 43-101.
7. I have read NI 43-101 and CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005). The work that I performed for this Technical Report is in compliance with NI 43-101, and conforms with generally accepted mining industry practices.
8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

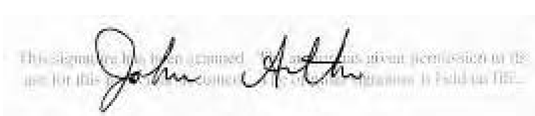
Signature Date 15 June, 2007.

Certificate

To accompany the Technical Report dated June 15, 2007, entitled “First Time Disclosure of Mineral Reserves, Hwini-Butre and Benso Properties, Southwest Ghana” (the “Technical Report”).

I, Dr. John Arthur, residing at 113 Clifden Road, Hackney, London, UK, certify that:

1. I am a qualified geologist and hold a B.Sc in Geology, M.Sc in Exploration and Mining Geology and have completed a PhD in Mineral Resource estimation from Cardiff University, UK. I am employed as a Principal Mining Geologist for SRK Consulting.
2. I am a member of the Institute of Material Minerals and Mining (MIoM^3) and a Fellow of the Geological Society of London (FGS), I also hold the title of Chartered Engineer and Chartered Geologist.
3. I have worked/practiced as a Geologist in the mining industry since 1987. I am a Qualified Person as defined by National Instrument 43-101 (December 2005) (“NI 43-101”).
4. The date of my last personal inspection of the Hwini-Butre and Benso properties is October 2006.
5. I have had responsibility for preparation of the Mineral Resource estimation for this Technical Report. I have not had any previous involvement in the property prior to the work carried out on behalf of Golden Star Resources.
6. I am not an employee of Golden Star Resources and hence I am independent as defined in Section 1.4 of NI 43-101.
7. I have read NI 43-101 and CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005). The work that I performed for this Technical Report is in compliance with the Instrument, and conforms with generally accepted mining industry practices.
8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I hereby consent to the use of this Technical Report for submission to any Provincial Regulatory Authority in Canada, and the Securities and Exchange Commission in the United States.



Signature ______________________ Date _____4th June, 2007