June 2010

VALE SOUTH AFRICA

External Audit of Coal Reserves for Moatize Coal Project

Submitted to:

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REPORT

Report Number. 12779-9783-2

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Golder Associates

Executive Summary

Golder Associates Pty Ltd (Golder) was requested by Vale to carry out an audit of the Coal Reserves of the Moatize coal project in Mozambique.

The work included review of the following main areas:

- Mining and Reserves
- Economic Analysis

This document reports the findings of the audit. The Maputo office of Moatize and the site itself were visited during the period 11 June to 15th June by Ross Bertinshaw (Principal Mining Engineer) and Johan Swart (Senior Coal Geologist) of Golder Associates. Sue Bonham-Carter (Principal Mining Engineer) and Al Tatersall (Senior Engineer) of Golder Associates met Vale staff in the Johannesburg offices 20 June 2010 to review the project financials.

The project is based on a mine producing 26 Mt/a of ROM which is sent to a processing plant outputting about 8.5 Mt/a of 10.5% coking coal and 2 Mt/a of export thermal coal (27.2 MJ/kg) for a period of at least 35 years.

Golder finds the Coal Reserves documentation and data put together to a good standard. The Reserves are based on two main studies. These are the 2006 BFS (Snowden 2006c) and the 2009 update (Snowden 2009a and 2009b). The BFS provides the basis for all the Mining Sections except 2A. The plan was updated for this Section in 2009 with extra holes and more detailed planning for what will be the initial mining area.

Golder believes that the Reserves are fully supported by the work and studies carried out to date.

The main problem has been a lack of solid audit trail at this time. This is not because the work and data is not available but because Moatize is in a transitional period between the Feasibility and implementation planning carried out by Snowden and the operational planning that is now being taken over by the Moatize staff on site.

These on site people will in the next year no doubt redo much of the work and hopefully produce a new set of Reserves which will be fully documented and backed up by their own work. During this work it is important they create a proper audit trail.

Construction of the CHPP and other mine infrastructure are well underway, so risk in these areas are rapidly reducing. Much of the initial mining equipment is already on site and is now operating in the box-cut.

Golder believes that the Reserves published at June 2009 and as given below (after correction for tabulation error) are reasonable and supportable.

Golder has not expressed any opinion on mineral resources and any reference to mineral resources, NPVs, costs and prices in this report or any of its annexes. Golder audited the Coal Resources as part of this project and found no material problems with the estimation of the Coal Resources, ant it was used for the validation of basic supporting information which is required to determine that the reserves are certified according to the SEC Rules and Industry Guide 7 and shall not be considered or relied upon by any investor, analyst or any company or person other than in relation to this specific purpose. The results from this audit can be found at the complete report "External Audit of Mineral Resources and Reserves for Moatize Coal Project,Report Number 12779-9783-1".

Coal Reserves at June 2009

Section	Class	ROM Coal	ROM Coal	Saleable Coking Coal	Saleable Coking Coal	Saleable Thermal Coal	Saleable Thermal Coal
		Mt (adb)	Mt (arb)	Mt (adb)	Mt (arb)	Mt (adb)	Mt (arb)
				(10.5% Ash)		(27.2 MJ/kg)	
1	**Proved**	78	82	28	31	7	7
	Probable	47	47	16	17	5	5
2A	**Proved**	73	76	25	28	4	4
	Probable	115	120	40	44	7	7
3	**Proved**	56	59	15	17	4	4
	Probable	4	4	1	1	0	0
4	**Proved**	150	157	54	59	14	15
	Probable	41	43	14	15	4	4
6	**Proved**	66	69	18	20	4	4
	Probable	325	340	98	107	29	31
Total Proved		423	443	140	155	33	34
Total Probable		532	554	169	184	45	47
Total Reserves		955	997	309	339	78	81
Notes	ROM(arb) assumes mositure added to give 4.6% total moisture						
	Coking Coal Product (arb) assumes moisture added to give 10% total moisture						
	Thermal Coal Product (arb) assumes moisture added to give 6% total moisture						

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1.0 INTRODUCTION

Vale asked Golder Associates Africa Pty Ltd (Golder) to conduct an external audit of Coal Reserves at their Moatize coal project in Mozambique to appropriate international standards. This report will support Vale's application for listing on the Stock Exchange of Hong Kong Limited. Accordingly, reference is made to the requirements of Chapter 18 of the exchange listing rules.

1.1 Project Description

The Moatize mine concession is located within the Moatize district about 20 km NE of Tete City in North-Western Mozambique (Figure 1). Tete is situated on the Zambezi River on a main truck route running to Zimbabwe, Malawi and Zambia.

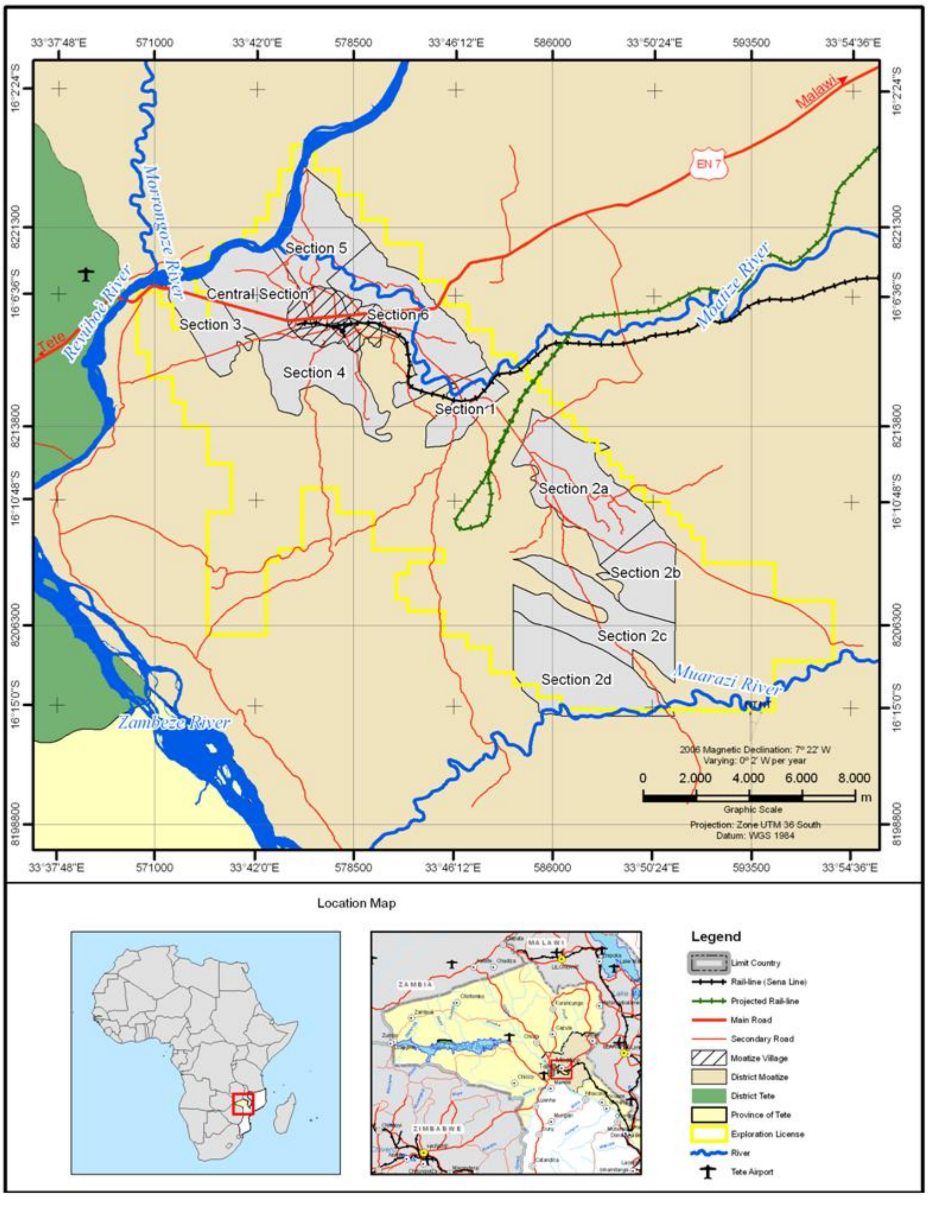

Figure 1: Location of Moatize Mine Site

The project is based on a mine producing 26 Mt/a of ROM which is sent to a processing plant outputting about 8.5 Mt/a of 10.5% coking coal and 2 Mt/a of export thermal coal (27.2 MJ/kg) for a period of at least 35 years. The mine depends on the Mineral Resources (CVRD 2006, Snowden 2006b) and the Mineral Reserves developed from the “Bankable” Feasibility Study (BFS) (Snowden 2006c) and updated mine planning of Section 2A in 2009 (Snowden 2009a, Snowden 2009b). The audit is for this project and the Resources and Reserves on which it is based and not on any potential expansion.

1.2 Regional Topography and Drainage

The project is located between the Rovubwe and Muarazi Rivers which both drain to the south-west towards the Zambezi River. The Moatize River is the main tributary of the Rovubwe River, with the confluence north-west of Moatize town. The Moatize River which cuts through Mining Sections 1, 6 and 5 forms a deeply incised channel near the confluence with the Rovubwe River. The Moatize River is seasonal with no surface flow during the dry season. The Rovubwe River is perennial but with reduced flow during extended dry periods.

1.3 Climate

The climate of the region is sub-tropical and semi-arid. Temperatures and evaporation are generally high and rainfall low. Three seasons can be differentiated during the year on the basis of rainfall and temperature:

- A hot wet season, which usually starts abruptly in late October/mid-November with the summer rains and ends gradually in mid-March/April;
- A cool winter dry season, extending from May until temperatures rise sharply again in late August or early September. The coolest period occurs during June/July; and
- A hot dry season extends from early September until the rains break in late October/mid-November.

1.4 Regional Geology

Various coal bearing Karoo formation occurrences are known to be present in Mozambique. The largest of these, the Middle Zambezi Basin (35 000 km^2), lies to the south-east of the Town of Tete, extending for approximately 150 kilometres along the Zambezi valley. The basin has an asymmetrical synclinal structure, bordered by faults, with several inclined blocks, in which the sedimentary sequence can be over 3 000 m thick. Coal formations in the Minjova basin, which is located in the Moatize area, occur in a graben structure.

The regional geology of the project area is illustrated in Figure 2.

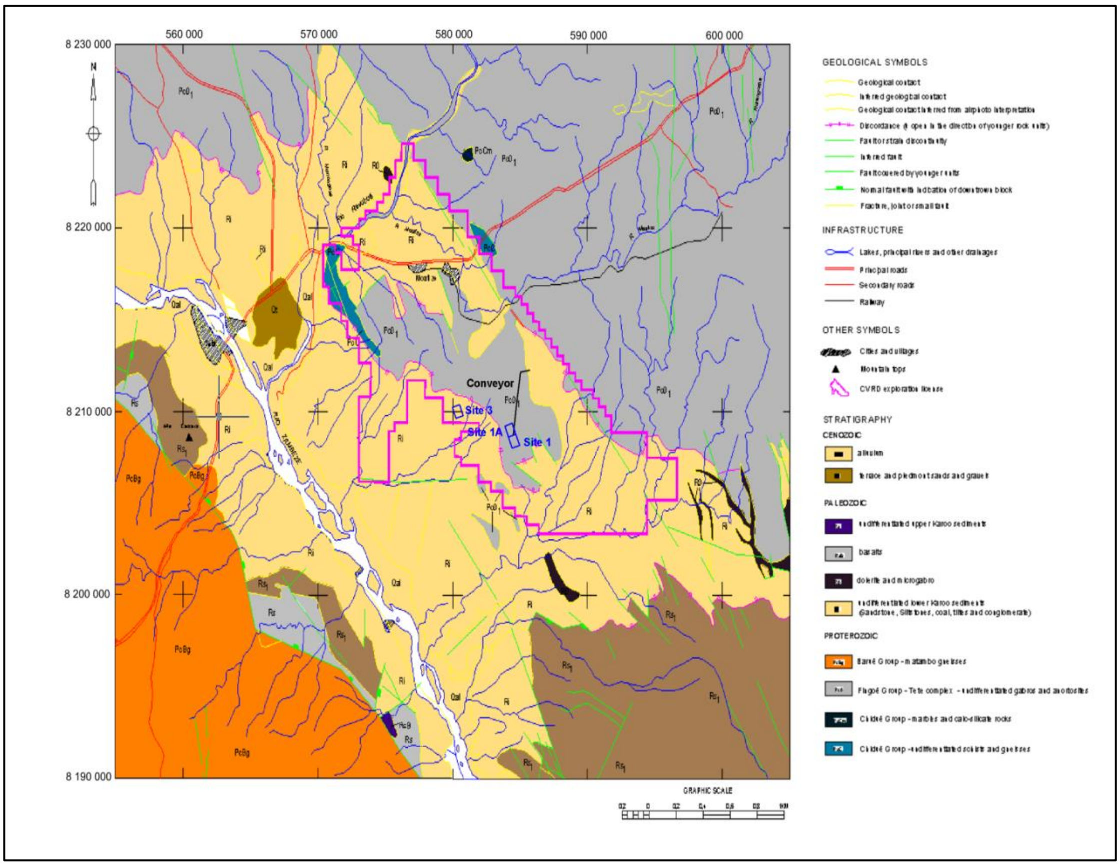

Figure 2: Regional Geology

1.5 Geology of the Moatize Coalfield

1.5.1 Stratigraphy

The Karoo age sediments consist of conglomerates, sandstones, shales and coal seams, deposited in a graben controlled basin. Figure 3 shows a simplified stratigraphic column. The sediments lie directly on Precambrian crystalline basement and have been subdivided (from top to bottom) into:

- Matinde Formation.
- Serie Produtiva.
- Tillite series.

The Matinde formation is the uppermost Karoo formation in the Tete/Moatize area and is comprised of a uniform series of coarse, highly compact cross bedded sandstones with locally developed conglomerates. Thin high ash coal and carbonaceous shales occur intermittently throughout the Matinde formation, but are not of economical value.

In the Moatize-Minjova basin, economically significant coal seams are present at intervals over a total stratigraphic thickness of 317 m within the Serie Produtiva only. It consists of a sequence of shales, mudstones and siltstones, intercalated with coal seams and carbonaceous shales. The sediments were deposited in a deltaic environment under stable conditions and slow subsidence. Coal is contained in six multi-seam coal bearing zones known stratigraphically from the youngest to the oldest as:

- Andre (± 1.5 m).

- Grand Falesia (± 11 m).
- Intermedia (± 9 m).
- Bananeiras (± 40 m).
- Chipanga (± 35 m).
- Souza Pinto (± 13 m).

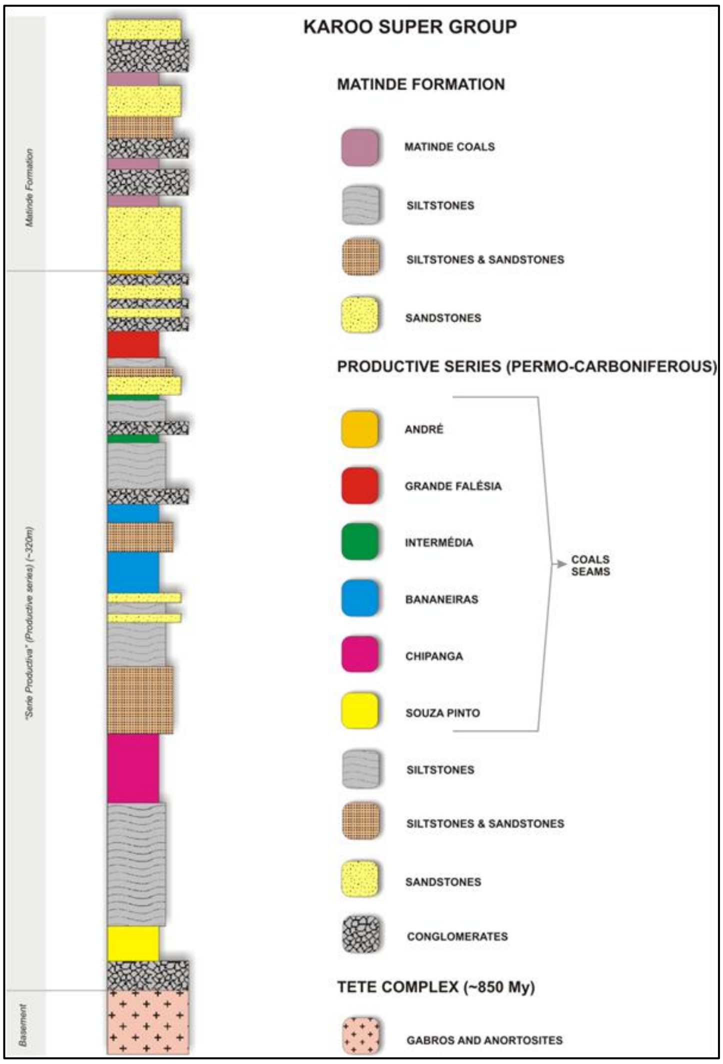

Figure 3: Simplified Stratigraphic Column

Seams consist of bright coal, mainly vitrinite, alternating with dull detrital coal, carbonaceous shale and shale. The shale to coal ratio in the Chipanga seam is in the order of 60/40

The Chipanga Seam is economically the most important of the coal seams, as it is thicker and laterally more extensive and therefore has the largest reserves.

The Tillite series forms the basal series of the Karoo in the area and correlates with the Dwyka series of South Africa. Its thickness is controlled by the pre-Karoo topography and varies from less than 10 m to 130 m. It is of fluvio-glacial origin and consists of tillites, varved shales and reworked glacial material.

Underlying the Karoo sediments inliers and occurring at surface surrounding the Minjova basin, the basement or Soco Cristalino is one of the family of African continental shields. In the middle of the Zambezi Basin, crystalline rocks are associated with the Mozambique System, the Tete Gabbro-Diorite Complex, and by acid intrusives.

1.5.2 Intrusions

Jurassic age dolerite intrusions have been emplaced largely along the main fault zones and are coeval with the formation of the East African Meso-Cenozoic Rift System. Sub-vertical dykes predominate and with the exception of the 50 m thick 'Great Dolerite Dyke', which crosses the central part of the basin, the dykes have an average thickness of 1 0 m. Dolerite sills are rare.

1.5.3 Structural Geology

The Moatize-Minjova Coal basin is a NW-SE trending graben, 20 km long and 7 km wide, associated with the Zambezi Valley distension zone. The graben is bounded by normal faults with throws of between 500 m and 800 m, which are marked by thick fault breccias.

At least two phases of normal faulting are present. The first trends NW-SE and NE-SW, causing the basin to break up into several discrete depositional centres, used also to define the boundaries between the Coalfield sections. These older sectional boundary faults typically have displacements of up to 100 m. There are six Mining Sections recognised, numbered 1 to 6 (Figure 4).

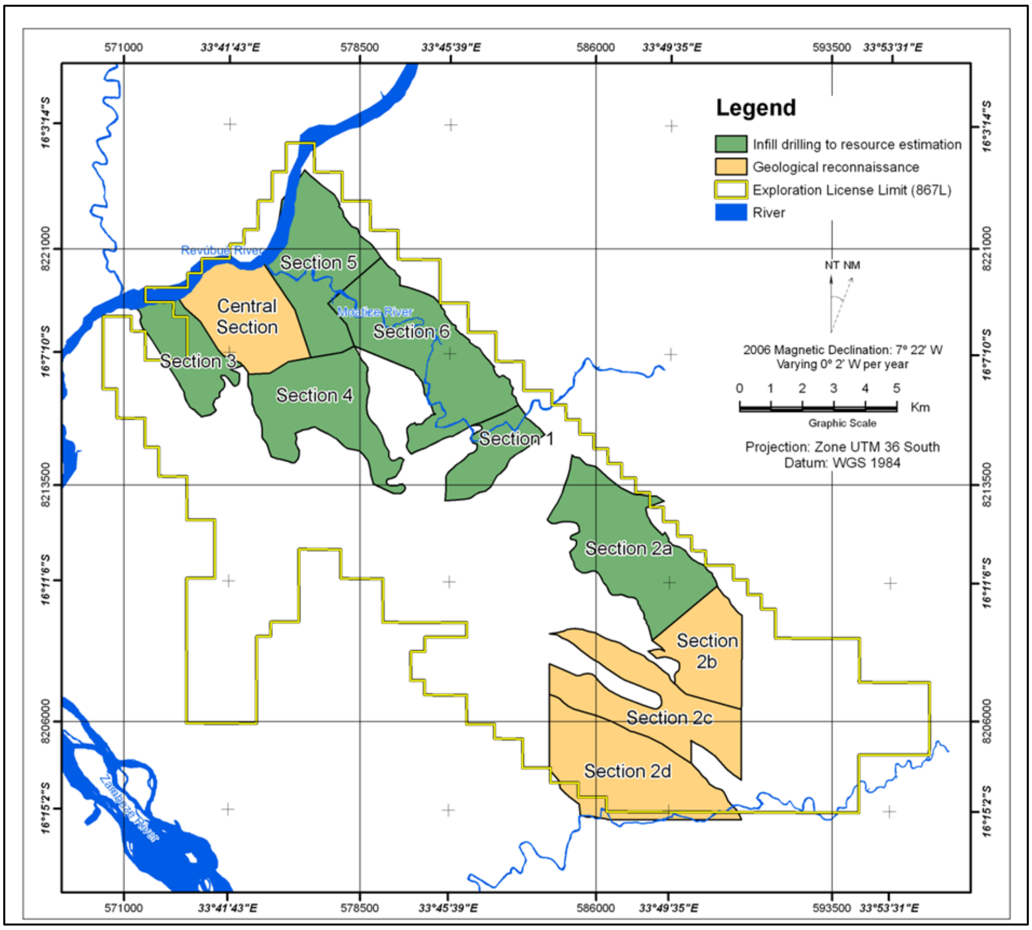

Figure 4: Division into Mining Sections

The faulting in the northern part of the basin is easily identifiable. The average dip of the fault in the existing workings of Section 6 is 45° to the west. In the southern part of the basin, the fault traces are more difficult to delineate and tend to comprise en-echelon structures, dipping 70 to 80° to the north-east.

Within each section a later phase of faulting with NNW-SSE/NNE-SSW trends have smaller displacements of between 10 m and 25 m. Where the faults have more than 25 m displacement, they delineate the blocks in each section and where these are less than 25 m, they delineate sub-blocks. The lesser faults are often manifested as several en-echelon faults with small vertical displacements between 2 m and 5 m.

In the existing underground workings of Section 6, these smaller faults tend to have a dip of 60 to 70° and occur with a frequency of one fault per 50 m panel.

Movement along the faults tilted the sedimentary blocks and hence the coal seams, causing dip changes from near horizontal to 10-25°. Tilting has also caused the development of broad asymmetric synclines and locally accommodation anticlines.

The main fault zones have been the preferred areas of intrusives. The intrusives are more prevalent in the southern part of the basin, as it is tectonically more unstable than the northern areas.

Two recent seismic occurrences have occurred within a reasonable distance of the proposed site and the Zambezi river valley is a known seismically active area.

1.6 History

The Moatize coalfield has been mined since the 19th century using underground methods. The planning for the development of the field as a large scale operation probably first started in the period 1978-1982 when Soviet and German technical missions drilled about 100 000 m of holes.

In 1990/91 a JV between the MIREME (Mozambique Ministry of Mining), CVRD and Trans-Natal Coal carried out a PFS for an integrated mine, railway and port project. This considered an open pit mine operating at 22 Mt/a of ROM and producing 6.7 Mta of coking and 2.3 Mt/a of thermal coal.

In 1991/92 Trans-Natal Coal (Ingwe) drilled an extra 3700 m and revised the original JV study.

In 1998 Druiker and JCI drilled 4300 m in Sections 1 and 2A.

In 2004 Mozambique vended the coalfield through a bidding system run by the World Bank. In November 2004 CVRD won the bid and began a Feasibility Study (FS).

As part of the FS an exploration program was carried out to confirm the tonnes and grade for a project producing, using open pit methods, 26 Mt/a of ROM for 25 years with a coking coal product quality of 10.5% ash.

As part of the process a Resource estimate was developed and published in 2006 (Snowden 2006a, Snowden 2006b). This Mineral Resource and model has been the basis of all the future mine planning and Reserve estimations. The latest Reserve statement is Snowden 2009b. These are therefore the Mineral Resources and Reserves estimates that Golder is auditing for this project.

2.0 CONTRACTUAL DETAILS

2.1 Scope

Golder has not expressed any opinion on mineral resources and any reference to mineral resources, NPVs, costs and prices in this report or any of its annexes. Golder audited the Coal Resources as part of this project and found no material problems with the estimation of the Coal Resources, ant it was used for the validation of basic supporting information which is required to determine that the reserves are certified according to the SEC Rules and Industry Guide 7 and shall not be considered or relied upon by any investor, analyst or any company or person other than in relation to this specific purpose. The results from this audit can be found at the complete report "External Audit of Mineral Resources and Reserves for Moatize Coal Project,Report Number 12779-9783-1."

Based on previous experience in conducting audits for Vale the following audit levels are employed:

Fatal Flaw (FF): Review of sufficient level to identify the presence of factors fatal to the project. Golder considers that this will require a site inspection, discussion with site personnel, and presentation of our opinion on the issue. This opinion is not backed up by any quantitative estimates of expected costs or risks.

Due Diligence (DD): Review of sufficient detail to identify and assess the significance of factors material to the financial outcome of the project or operation. This requires examination of data presented by Vale, independent verification of a selection of the data, and presentation by Golder of an estimate of the likely impact on the financials of the project or operation as a sensitivity estimate (expected ±% change of some parameter in the financial data presented to Golder.)

Comprehensive Audit (CA): Review of sufficient detail to verify the accuracy of supporting information, verify methods used, or to independently validate critical steps and estimates. Golder considers this to be a very comprehensive process, including independent validation or re-estimation of components critical to the estimate. We have allowed extra time and focused the audit on these issues to ensure the requirements to file to the HKEx under Chapter 18 are met.

Following is a summary of the major audit items with relevant levels of audit.

2.1.1 Mining and Reserves

- Assessment of Mining Method (CA).
- Geotechnical Investigations (DD).
- Mining Equipment (DD).
- Mining Rate (CA).
- Mine Services (FF).
- Grade Control (Ore Chemistry Control) – (FF).
- Mine Recovery (Mineability) and Dilution (DD).
- Conversion of Resource to Reserve (DD).
- Processing (DD).

2.1.2 Economic Analysis

- Life of Mine Plan – (DD).
- Cost Estimates (Mining, Processing, G&A, others) – (DD).
- Cash Flow Model and Sensitivity Analysis – (DD).
- Technical or Other Risk.

2.1.3 Work Program

The work was carried out by the following team:

- Ross Bertinshaw – Golder Associates – Principal (Mining Engineer)
- Johan Swart – Golder Associates – Principal Geologist
- Sue Bonham-Carter – Golder Associates – Associate (Mining Engineer)

- Alan Tattersall – Golder Associates – Senior Mine Engineer

Ross Bertinshaw and Johan Swart visited the Vale offices in Maputo from 11th June to 13th June and the mine site at Moatize on the 14th and 15th June to collect data and see the actual progress of construction and development of the mine site.

At that time discussions were held with:

- Josh Preston – Manager Long Term Planning – Vale Australia.
- Daniel Travassos – Geologist – Vale Global Exploration and Project Development.
- Leonardo Ramos – Mining Engineer – Vale (Expansion Project).
- Cezar Medina – Expansion Project Moatize Vale.
- Edison Petter – CHPP Operations Manager.
- Reinaldo Goncalves – Mine Planning and Geology Manager.
- Leonardo Xerinda – Senior Geologist.
- Leon Hendrikz – Technical Marketing Manager.

Sue Bonham-Carter and Alan Tatersall held discussions in Johannesburg on 21 June with:

- Joao Sichieri – Corporate Finance Manager.

2.1.4 Report Format

In this report the conclusions are presented in the text in ***bold italic font*** and collated in Section 5.0.

2.2 Public Disclosure and Independence

We declare that for the purpose of this audit, the Golder team can be considered to be an independent third party. The personnel proposed have had no involvement in the production of resources or reserves for Moatize. We note that Golder has been involved in the Moatize Coal Project in a continuing role as a consulting engineer and is currently on-site doing ground engineering studies.

2.3 Notes to the Report

The commonly used abbreviations used in this report are summarised in Table 1. The coordinates are in WGS 1984 UTM Zone 36 South.

All currency is in $US unless otherwise noted.

The names Vale and CRVD will be used interchangeably throughout the report.

Table 1: Abbreviations

adb	Air dried basis
arb	As received basis
asb	As sampled basis (same as arb)
bcm	Bank cubic metres
BD	Bulk Density
BFS	Bankable Feasibility Study
CHPP	Coal Handling and Preparation Plant
CVRD	Companhia Vale do Rio Doce
DCF	Discounted Cashflow
DTM	Digital terrain model
EESJV	ELB, Sedgeman, Semane Joint Venture
FC	Fixed Carbon
FOB	Free on Board
FS	Feasibility Study
FSI	Free Swelling Index (same as Crucible Swelling Number)
Golder	Golder Associates Pty Ltd
GPS	Global Positioning System
JORC	Joint Ore Reserve Committee
kt	Thousand tonnes
MARC	Maintenance and Repair Contract
MJ/kg	Million joules per kilogram
Mt	Million tonnes
OEM	Original Equipment Manufacturer
Mt/a	Million tonnes per annum (year)
PFS	Pre-Feasibility Study
QAQC	Quality Assurance and Quality Control
RDMZ	Rio Doce Mocambique (Subsidiary of CVRD)
ROM	Run of Mine
SMU	Selective Mining Unit
t	Metric tonne
UTM	Universal Transverse Mercator
Vale	Vale
VM	Volatile Matter
WGS 1984	World Grid System 1984 version

3.0 MINING AND RESERVES

The mine planning on which the Reserves are based has been mainly carried out by Snowden from the original feasibility study to the implementation planning. Only now is Vale taking over the actual planning work as the operation moves into an operational phase. This has meant a lack of a good audit trail due to no one on-site understanding exactly the tonnages and grades were obtained from the models.

Golder found in validating the BFS reserves with those currently in use at site that there was no clear audit path between them.

Other consultants such as Golder (mine slopes, hydrology) and URS (water management) have been involved in providing input into this work. Snowden and all the other consultants are competent, experienced and reputable.

The Reserves, of which the latest are Snowden (2009b) and are attached in Appendix B, are based on:

- The Mine Feasibility Study by Snowden (Snowden 2006c).
- Update to the Section 2A area using infill drilling and experience to redo the geological model in that area (Snowden 2009a).

Essentially the Section 2A update changed none of the other work, so the 2006 BFS study is still the main source of data.

The 2006 Reserves are based on the Measured and Indicated Resources given in Table 2 below. This is from Snowden (2006d). These Resources are slightly less than the Resources published in September (Snowden 2006b) as shown in Table 3.

The main difference is in the Sousa Pinto seam where the September Resources contain about 125 Mt more.

This is typical of a Feasibility Study where the mine planning must be carried out on an earlier version of the geological model to achieve the required time frames.

Golder does not believe this effect the Reserves reported.

Table 2: Mineral Resources used for Mine Feasibility Study (Snowden 2006c)

Seam	RD[2] (g/cm^3)	TTIS[3] (Mt)	Geological loss[4] %	Previously mined[5] (Mt)	MTIS[6] (Mt)
Grande Falésia	1.75	54.7	2	0	53.6
Intermedia	1.73	94.3	2	0	92.4
Bananeiras	1.69	303.4	2	0	297.3
Upper Chipanga	1.69	527.9	2	0	517.3
Middle Chipanga	1.77	82.0	2	0	80.4
Lower Chipanga	1.64	446.7	2	29.75	408.0
Souza Pinto	1.94	429.4	2	0	420.8
Total	1.74	1938.2	2	29.75	1,869.7

Table 3: Published September 2006 Resources

Seam	RD[2] (g/cm^3)	TTIS[3] (Mt)	Geological loss[4] %	Previously mined[5] (Mt)	MTIS[6] (Mt)
Grande Falésia	1.76	56.4	2	0	55.3
Intermedia	1.76	96.1	2	0	94.1
Bananeiras	1.69	303.5	2	0	297.5
Upper Chipanga	1.69	530.8	2	0	520.2
Middle Chipanga	1.77	84.3	2	0	82.6
Lower Chipanga	1.64	455.4	2	29.8	416.7
Souza Pinto	1.96	556.9	2	0	545.7
Total	1.76	2083.4	2	29.8	2011.8

1-area in hectares

2-laboratory determined air dried raw relative density

3-total tonnes in situ expressed as million tonne (Mt)

4-percentage internal geological loss due to dykes and minor faulting

5-previosly mined Lower Chipanga Seam workings expressed as million tonne (Mt)

6 - minable tonne in situ i.e. TTIS less geological loss and mined loss

The layout of the sections containing Reserves is shown in Figure 5.

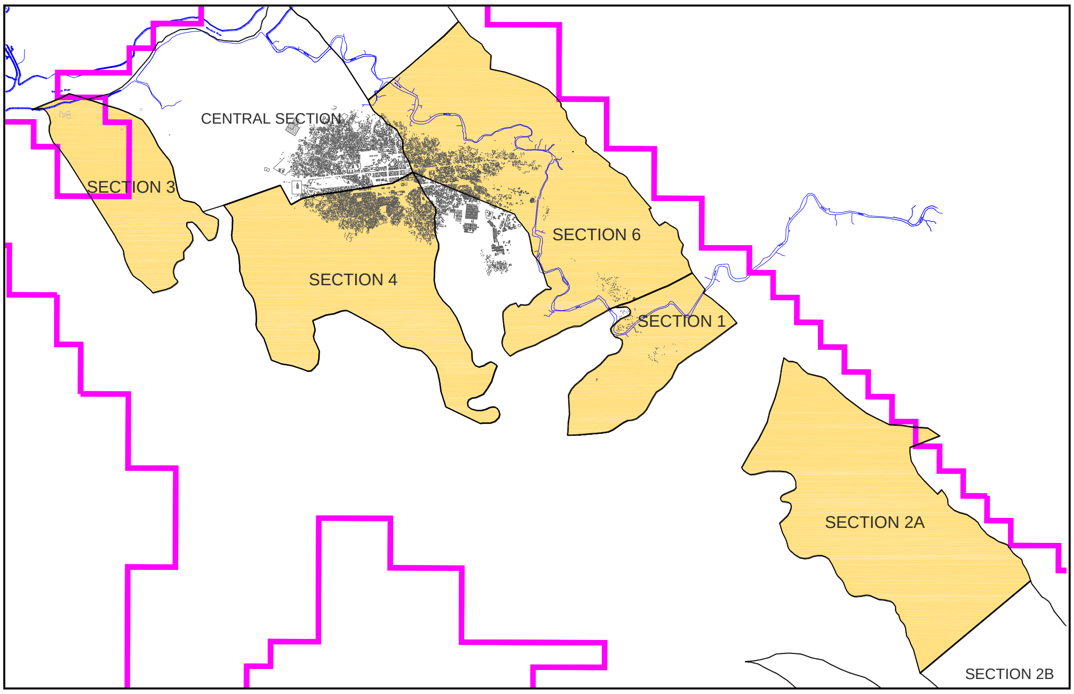

Figure 5: General Layout of Sections where Mining will Occur

Section 1 is the smallest section and has the Moatize River meandering through it. There were some old workings in Section 1 in the Lower Chipanga Seam.

Section 2A is predominantly low lying and flat with no previous workings.

Section 3 is located on the western edge of the concession and is low lying and relatively flat.

Section 4 is located to the south of Moatize village.

Section 6 is centrally located and lies to the north-east of the concession; it is predominately undulating. The Moatize River runs through the central region of this section which although mainly dry, in the wet season is known to have a considerable water flow.

The Section 5 was omitted due to the proximity of the river to North and the presence of dykes and faults within the section and therefore the uncertainty associated with potential groundwater flow through it.

3.1 Assessment of Mining Method

The mining method chosen is to use large scale open pit mining truck and shovel system to mine the Moatize deposit. The basic production rate is 26 Mt/a ROM feed to the processing plant with 52 Mbcm/a of primary waste at an average prime stripping ratio 1.95 bcm/t ROM (arb). Material movement averages 71 Mbcm/a, making Moatize a high volume mining operation.

During the PFS Snowden had investigated two possible mining systems for the overburden removal.

- Dragline.
- Truck/shovel.

The dragline option was rejected due to lack of available skilled personnel, high capital and unsuitability of seam geometry for dragline operation.

Golder concurs with the selection of a truck/shovel system.

The mining system uses a fleet of 230 t Trucks (Cat793) and four large hydraulic excavators (Hitachi EX5500) for loading. The FS originally assumed electric rope shovels for the waste with hydraulic excavators for the coal. Use of the same units for both coal and waste mining simplifies training and maintenance.

The coal will be hauled to the primary crusher at the ROM pad from where a conveyor will transport the coal to the Coal Handling and Preparation Plant (CHPP).

The mining fleet will also be responsible for haulback of the coarse rejects from the plant into the mined out portions of the pits.

3.1.1 Mine schedule

Mine scheduling was carried out using XPAC software with data obtained from the geological model and mine designs.

The primary aim of the mining schedule was to target a production rate of 26 Mtpa (arb) of ROM coal. The production was ramped up over a 4.5 year period. It was expected that the mine would have a minimum life of approximately 35 years.

From the ROM production the CHPP is planned to produce two products:

- High quality metallurgical coal (coking) at a 10.5% ash.
- Export thermal coal of 27.2 MJ/kg specific energy.

The current production schedule shows waste stripping starting in July 2010. This is delayed from the 2009 start date shown in the BFS tables below. The schedule is based on the 2010 Budget and ramps up to full production of 26 Mt/a by the end 2015. The 2010 Budget update is limited to years 1 to 5, the LOM for years 5 to 35 remains as presented in BFS. The schedule demonstrates that the mine plan is feasible from a global perspective and that the targets, as set by Vale, are within the capabilities of the coal resource and the mining methods.

Golder believes that the scheduling parameters and ramp-up are aggressive but achievable.

The CHPP and deposit has the capability to produce products of different quality, for example a low quality thermal coal with a higher yield that could feed a local power station.

Figure 6 and Figure 7 show the BFS coking and thermal coal project tonnages over life of mine and the seams that make it up.

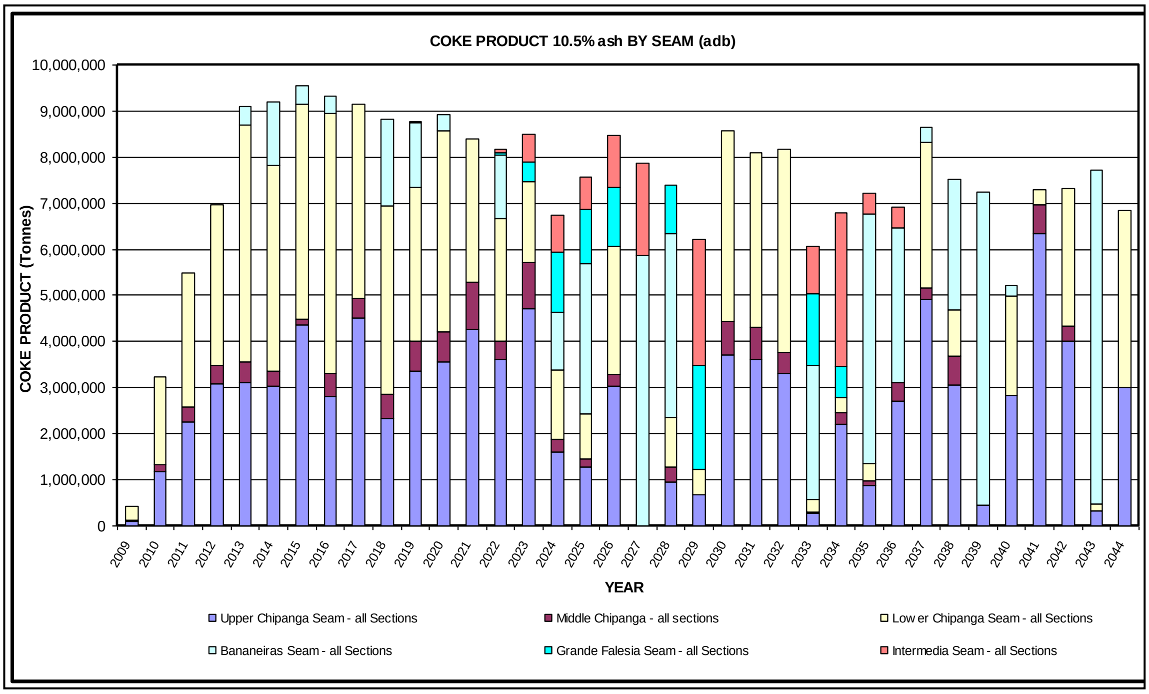

Figure 6: BFS Coking Coal Product over Life

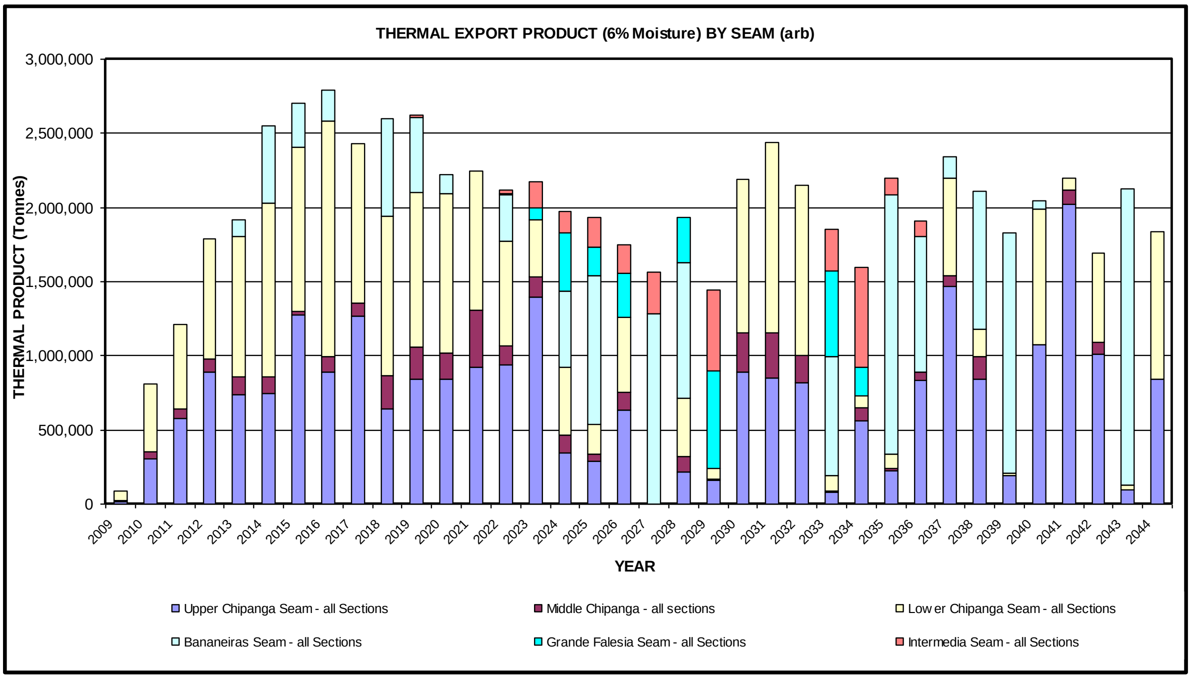

Figure 7: BFS Thermal Coal Production

Figure 8 gives the total material movement per year which averages 71 Mbcm/a but can reach over 110 Mbcm/a. This is a substantial operation in any terms.

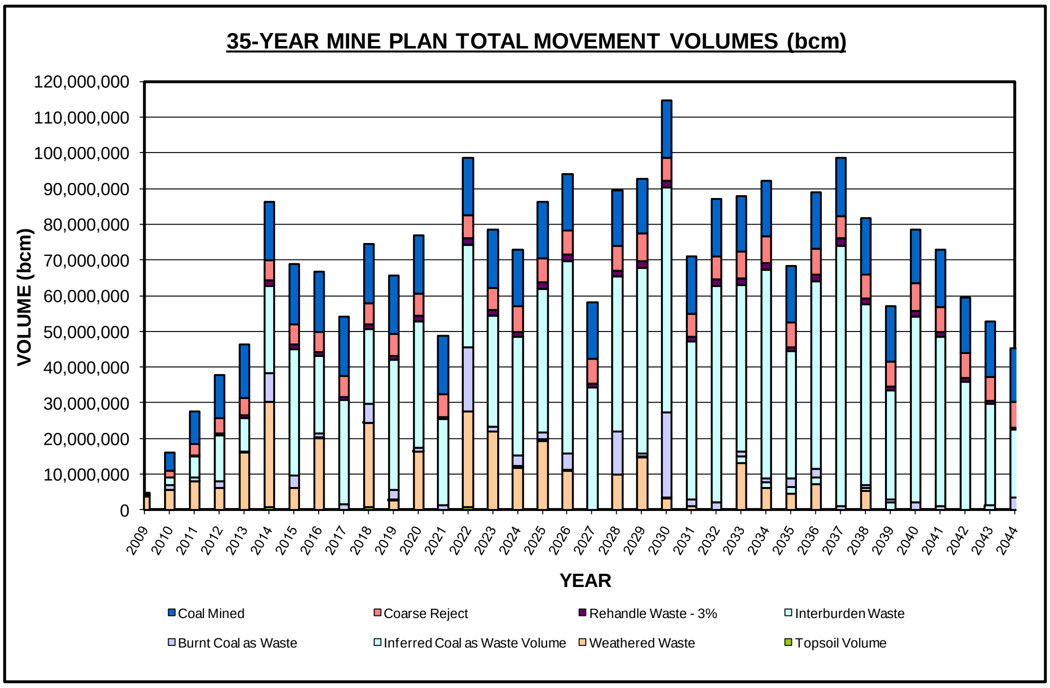

Figure 8: Total Material Movement by Year

3.2 Geotechnical Investigations

3.2.1 Water Management

The main surface water impact from the proposed mine developments will be interruption to the existing surface water flow patterns and a potential reduction of surface water runoff volume and quality in the downstream environment.

The average rainfall for the area is in the order of 640 mm per year which mainly occurs in a short period during the months of November through to April. Snowden has allocated 15 days per year during which the operations are suspended due to rainfall.

Inflows from rock aquifers are expected to be low. However, the breaching of the river alluvium will generate large inflows. Eliminating baseflow by means of river diversion can substantially reduce these flows in any event. The alluvium along the Moatize River will however need to be dewatered prior to mining to prevent inflows into the open pits.

The basic water management strategy is:

- Bunding to control surface water.
- Diversion of upstream flows and where this is not possible, water entering pits will be used for processing purposes.
- Use of riprap pads to slow and disperse flows.
- In-pit water to be treated through sediment ponds.
- Backfilling of pits using waste or coarse rejects from processing plant.
- Sumps to handle run-off from rainfall events.

Golder believes that the water management strategy is appropriate for the operation.

3.2.2 Slopes

A series of geotechnical investigations were carried out by Golder starting in 2005. Table 4 gives the recommend overall slope angles (Golder 2006a).

Table 4: Recommended Overall Slope Angles for the Feasibility Study

Section	Maximum Pit Depth (m)	OSA
2A	140	55°
1 (West)	120	50°
1 (East)	100	63°
4	120	49°
6	170	40°
6	100	51°
3	110	46°

Golder reviewed the mine designs provided (july2008_pitdesigns.dxf) to confirm that the pit design slope angles follow the above recommendations. The wall designs generally meet or are less than the overall slope angles in Table 2. A more detailed discussion is included in Section 3.3.

3.2.3 Waste Dumps

The latest waste dump design parameters developed for the Section 2A planning are given in Table 5 (Snowden 2007). These are based on an assumed 50% coarse reject to ensure geotechnical stability and easy rehabilitation.

The waste dump design parameters are reasonable and Golder supports their use.

Figure 9 shows how the external dumps are located with respect to the mining sections. The external dumps are required for each section until a large enough space is opened on the pit floor. Until the in-pit dumps become available the coarse reject will need to be encased in pit waste to reduce the risk of acid mine drainage.

Table 5: Waste Dump Design Parameters

Dump	In Pit	Out of Pit
Overall Slope Angle	25°	14°
Lift Height	20 m	20 m
Lift Batter angle	37°	37°
Berm width	20.4 m	54 m

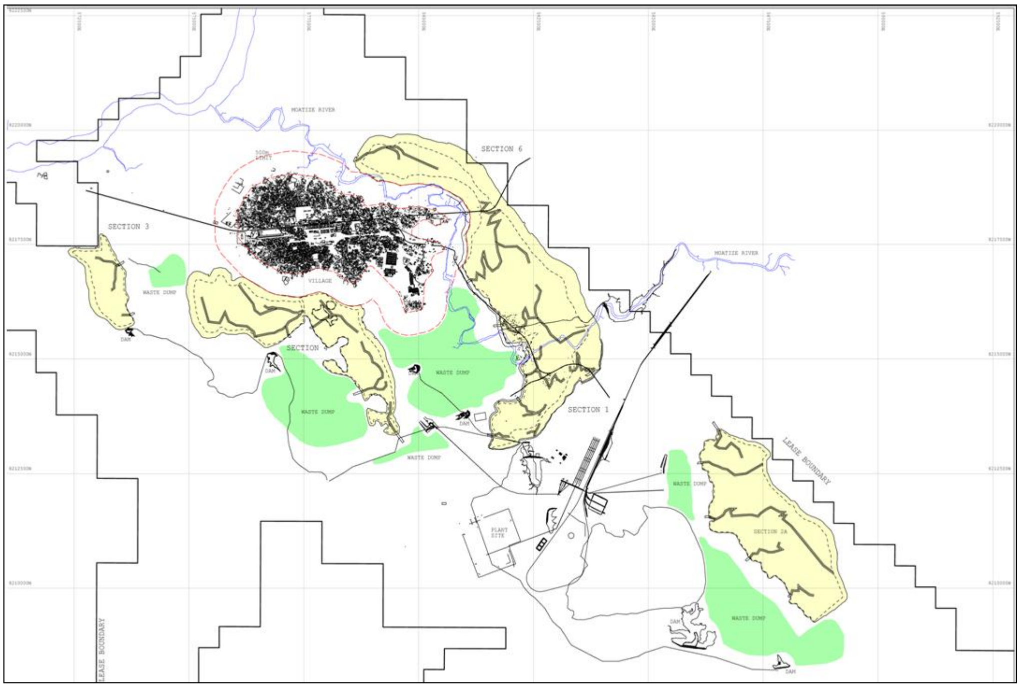

Figure 9: General BFS layout showing external dumping areas

The Snowden report demonstrated the ability to handle dumping over the first 4.5 years.

Golder believes that there is no particular reason why the mix of in-pit and out of pit dumps cannot be used to handle the waste from all the sections plus the coarse rejects from the preparation plant.

3.3 Mine Design

A series of open pit optimisations using the industry standard software “Whittle 4X” was carried out as part of the FS. This was aimed at finding suitable pit outlines containing 35 years of production and giving the maximum value.

3.3.1 Optimisation

A regularised model was created from the geological variable height model for use in the optimisation process. The model contained coal and waste rock types, section codes to control slopes plus quality variables for product yield for the coking and thermal products.

Only Measured and Indicated Resources were used in the optimisation.

Table 6 summarises the main parameters used in the BFS 2006 optimisation for the mixed coking and thermal coal scenario and 2009 updated values for Section 2A. The 2010 budget estimates are included for comparison purposes.

A mining recovery of 95% was used with no extra dilution than already contained within the model was added.

A mining cost of $0.88/t was applied to all material. The coal processing cost of $2.37/t ROM (includes washing, incremental ore haulage and rejects back haulage).

Table 6: Whittle Optimisation Parameters

Study Year	**2006**	**2009 (Section 2A)**	**Budget 2010-2015**
Mine Life	35	35	35
Mining Recovery (%)	95	95	94
Dilution (%)	0	0	0
Mining Cost ($US/t)	0.88	1.09	2.12
Processing cost ($US/t ROM)	2.37	4.81	4.66
Rail ($US/t product)	8.50	15.43	31.64 (total for port, Rail and overhead)
Port ($US/t product)	1.25	9.87	
Overheads @ 5% ($US/t Product)	0.36	2.53	
Coking (10.5% ash) price ($US/t FOB)	57	82.37	199.43
Export thermal (27.5 MJ/kg) ($US/t FOB)	24	45.15	54.21
Domestic thermal ($US/t)		12.24	12.60
Production rate (Mt/a)	25	26	26
Discount rate (%)	15	15	12

The optimisation results for the 10.5% coking coal and 27.5 MJ/kg thermal coal with Section 5 removed are given below (Figure 10, Table 7 and Table 8)

The optimum pit was defined as the pit giving 75% of the Best Case value. The Mining Inventory Case is substantially larger than this with a small drop in 75% Case value and a substantial drop in Worst Case value.

The final pit was selected by finding the shell giving 35 years production (875 Mt).

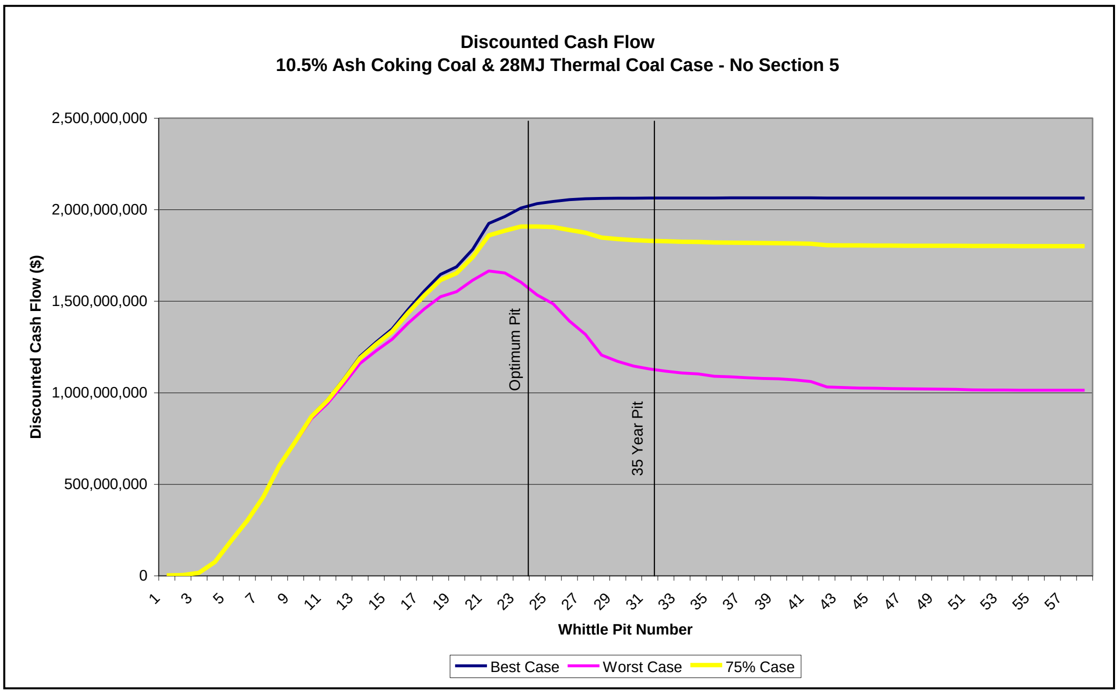

Figure 10: Cashflow Summary from Optimisation

Table 7 shows the coal within the selected shell and has slightly less than the required 875 Mt. The selected pit shell was expanded in the mine design software to achieve the appropriate amount for the required life.

Table 7: Mining Inventory Tonnages (Pit 32)

Section	In Situ Mt	Coking Product Mt	Thermal Product Mt	Total Product Mt
1	103.9	37.3	18.2	55.6
2	177.5	65.9	31.1	97.0
3	17.2	3.7	1.5	5.1
4	162.7	53.5	24.4	77.9
6	386.0	115.2	41.3	156.5
Total	847.2	275.5	116.5	392.0

Table 8: Optimum Pit Tonnages (Pit 24)

Section	In Situ Mt	Coke Product Mt	Thermal Product Mt	Total Product Mt
1	73.6	27.1	12.8	39.9
2	107.0	42.2	19.2	61.4
3	13.6	3.1	1.3	4.4
4	123.2	42.6	20.0	62.7
6	206.3	66.2	22.8	89.0
Total	523.7	181.3	76.1	257.4

The optimisations for the entire deposit have not been redone since 2006, so the question is are they still robust. Comparing the 2006 optimisation and Budget 2010 costs and product prices:

- Mining costs have increased by 2.4 times ($0.88/t to $2.12/t mined).
- Processing costs have increased by 2.0 times ($2.37/t to $4.66/t ROM).
- Rail, Port and OH costs have increased by 3.1 times ($10.11/t to $31.64/t Product).
- Coking coal price have increased by 3.5 times ($57/t to $199/t coking coal).
- Thermal coal price have increased by 2.3 times ($24/t to $54/t thermal coal).

As the figures show the revenues have at least kept pace and have probably increased faster than the costs. This suggests that the 2006 optimisation and selected pits are still suitable as the basis for LOM planning and Mineral Resources.

3.3.2 Mine Design Parameters

The basic mine design parameters are given in Table 9.

Table 9: Mine Design Parameters

Design Parameter	Parameter
box cut widths (m)	150
strip widths (m)	150
Block length (m)	300
box cut low-wall and highwall angle (deg.)	63
Waste working bench high wall angles	See below
Natural spoil angles (deg.)	35
Overall dump slope angle (deg.)	25° (inpit) or 14° (expit)
Max Dump lifts	40 m
Max Dump Height ASL or RL	Fill to natural topography, outward draining
Waste density	2.3 or from model
Swell of waste	25%
Swell of coal	30%
Final dump Swell	20%
Minimum mining thickness of waste	0.5 m
Dozer Rip (coal and waste) – D&B limit Final strip waste bench width	3 m 100 m

These mine design parameters are reasonable industry standards and Golder concurs with their use.

Table 10 gives the highwall design parameters. The overall slope angles are considered reasonable.

Table 10: High Wall Design Parameters

Section	Bench No.	Batter Angle (deg.)	Bench Ht (m)	Berm Width (m)	Target Overall Slope (deg.)
1	1-varies	63	40	13.2	50
	Final	63	40	6.6	50
2A	1-varies	63	40	7.6	55
	Final	63	40	3.1	55
3	1-varies	63	40	18.3	46
	Final	63	40	9.1	46
4	1-varies	63	40	14.4	49
	Final	63	40	7.2	49
6	1-varies	63	40	27.3	40
	Final	63	40	13.6	40

Designs were completed for Sections 1, 2A, 3, 4 and 6. Section 5 was omitted due to uncertainly with regards water ingress from faulting and alluvial sediments near the river.

Golder believes that the wall design is appropriate for the level of study.

Another constraint considered in the designs was the inclusion of a safety zone of 500 m between the outskirts of Moatize village and the pits in Sections 4 and 6.

There is the potential for over stripping in acute pit corners if merely projecting design lines – the intersection of two slopes will be much flatter than required to expose material at the toe. Consider adding a face at the design angle to “fill” in the corner in some of the designs to reduce waste stripping.

Highwalls that intersect underground workings in Sections 1 or 6 may need a reduced slope angle.

The mine plan allows plenty of opportunity to refine highwall performance as mining strips advance and interim highwalls are constructed.

Figure 11 gives the BFS site layout with Infrastructure and pits at the end of 35 years.

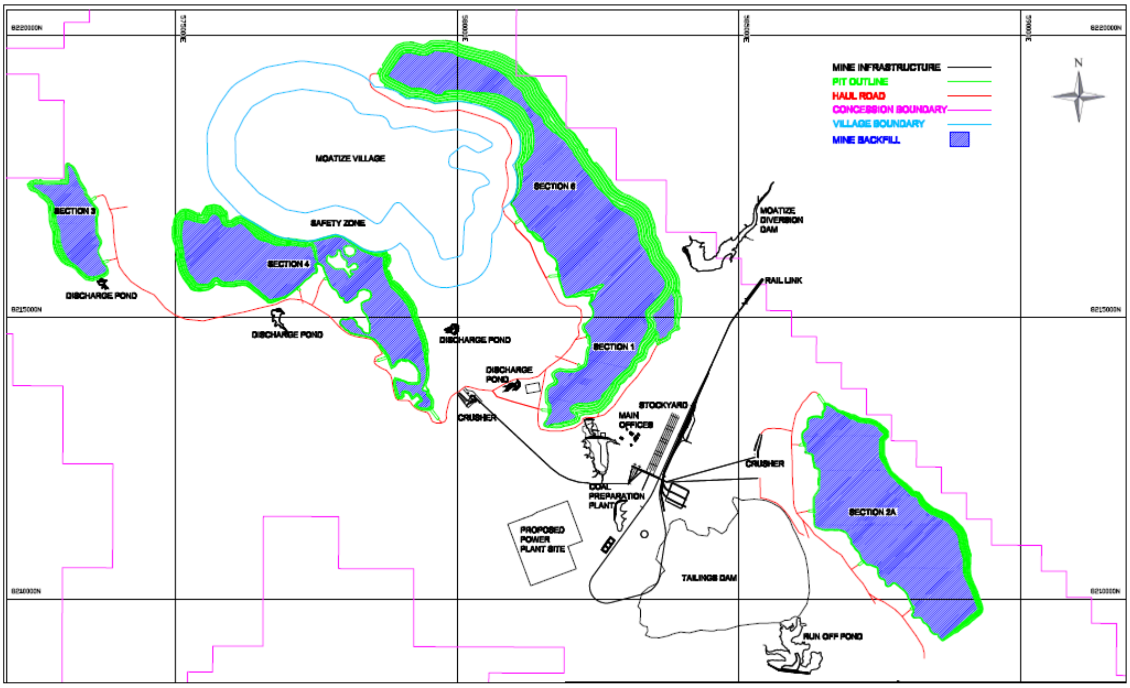

Figure 11: BFS Pits and Site Infrastructure at end of 35 years

3.4 Mining Equipment

Moatize is a multi-seam, multi-pit high volume, long life operation. The seams dip at moderate angles and fault zones and dykes interrupt the coal seams. The mining system selected for the operation is large truck shovel.

The BFS planned to use 43 m^3 electric rope shovels in waste on benches to 20 m high. In the implementation stage these were replaced by diesel powered Hitachi 29 m^3 EX5500 excavators fitted as backhoes. This was due to concerns regarding power supply and the ability to bring the largest components on-site

The change adds some cost but gains flexibility and consistency in the fleet, as the same Hitachi 29 m^3 EX5500 excavators will be used in waste and coal.

Figure 12 shows the how the BFS planned to mine the seam and waste material.

Golder finds the mining method and equipment suitable for the operation.

Figure 12: Mining Method

Table 11 shows the BFS primary equipment fleet over the life of mine. Haulage of waste and coal is by 240 tonne class trucks as planned in the BFS. Ten 240 tonne Caterpillar 793D trucks are currently on-site and more will be added to the fleet as production is ramped up, to a total of 29 by the end of 2014. Maximum truck numbers in the BFS reach 92 (240 t) units plus 19 (150 t) units for rejects haulage.

Table 11: BFS Primary Production Equipment Fleet

Equipment Type	Number of units						
	2009-2014	2015-2019	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044
43 m^3 Electric Rope Shovel	2	2	3	3	3	3	2
26 m^3 Hydraulic Backhoe	2	3	3	4	4	4	3
19 m^3 Wheel Loader	3	4	5	6	4	4	3
230-tonne Haul Truck – WASTE	22	33	31	42	65	67	58
230-tonne Haul Truck – COAL	14	18	21	22	22	25	27
150-tonne Haul Truck – REJECT	3	15	18	19	19	19	18
Water Truck	5	7	7	9	9	9	9
Drill – 311 mm dia.	1	1	2	3	3	2	2
Drill – 270 mm dia.	1	1	2	2	2	2	2
575 kW Trackdozer	9	13	14	17	17	17	10
Wheel Dozer	5	7	7	9	9	9	7
Motor Grader	5	7	7	9	9	9	7

The actual equipment being purchased is given in Table 12. The mining equipment is large scale trucks and shovels purchased from major equipment suppliers (Caterpillar, Atlas Copco, Marathon LeTourneau and

Hitachi). MARC contracts have been negotiated directly with the OEMs to maintain and repair the equipment.

Golder considers this to be all industry standard equipment from good suppliers and see no particular problem with the equipment selection.

Golder has sighted detailed equipment productivity calculations supporting the planned BFS primary production fleet, and finds the assumptions and methods of calculations used for equipment fleet and cost projections to be reasonable.

Table 12: Budget 2010-2015 Equipment:

Equipment	Manufacturer	Model	Capacity/Power	Number of Equipment					Total
				2010	2011	2012	2013	2014	
Trucks	Caterpillar	793D	240 tons	10		6	8	5	29
Water Truck	Caterpillar	777 WT	85 m^3	2					2
Excavator	Hitachi	EX5500	29 m^3	2		1	1		4
Loader	Letourneau	L1850 *	42.6 tons	2	1				3
Loader	Letourneau	L950	24.5 tons	1					1
Dozer	Caterpillar	D10T	646 hp	3	2	1			6
Dozer	Caterpillar	D11T	935 hp	2	1			2	5
Motor Grader	Caterpillar	16M	297 hp	3		1	1		5
Wheel Dozer	Caterpillar	854K	904 hp	1		1	1		3
Drill	Atlas Copco	PV275	Ø 270 mm	2		1			3

The haulage and excavator fleet has been modified from that proposed in the BFS. The BFS schedule showed 36 × 230 tonne trucks by the end of 2014, plus 3 × 150-tonne trucks for rejects haulage. For excavators the BFS schedule showed 2 × 43 m^3 shovels plus 2 × 26 m^3 excavators.

The current Budget 2010 – 2015 schedule shows 29 × 240-tonne haul trucks and 4 × 29 m^3 excavators by the end of 2014 ramp up period. Vale has provided Golder with haul truck and excavator productivity calculations that support their revised fleet requirement. The calculation method is consistent with industry standard methods and founded on reasonable first principle haul speed, excavator productivity, and equipment availability and efficiency assumptions. It also allows for a scaled one year training period of reduced excavator productivity.

The number of trucks required later in the mine life is huge and there is potential to use larger units (300 t) and mobile crushers and conveyors in the pit. The present mine services are designed to take 300 t units so there will be no limitation created by the mine infrastructure.

The mining method and equipment selected are suitable for the deposit and planned size of operation.

3.5 Mining Rate

The BFS called for a 4.5 year ramp-up to full production (Figure 13 and Figure 14). The 2010-2015 Budget ramp-up is modified to achieve full production by 2016 as in the BFS, after a delayed start in 2010. The mining rate after 2016 has not been modified.

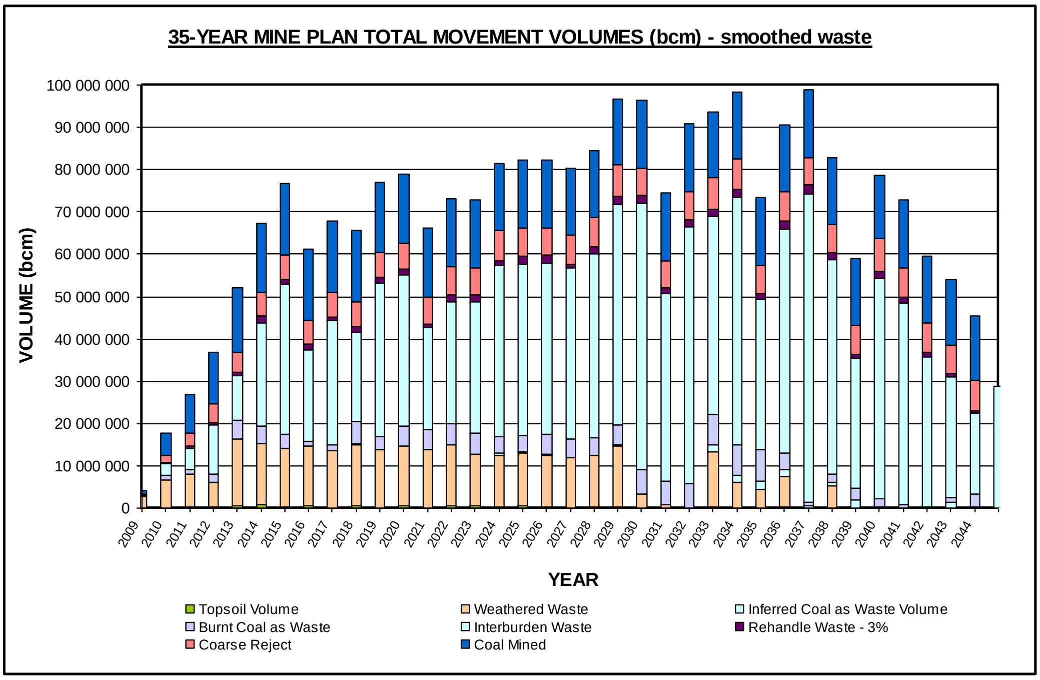

Figure 13: Waste Movement (Smoothed)

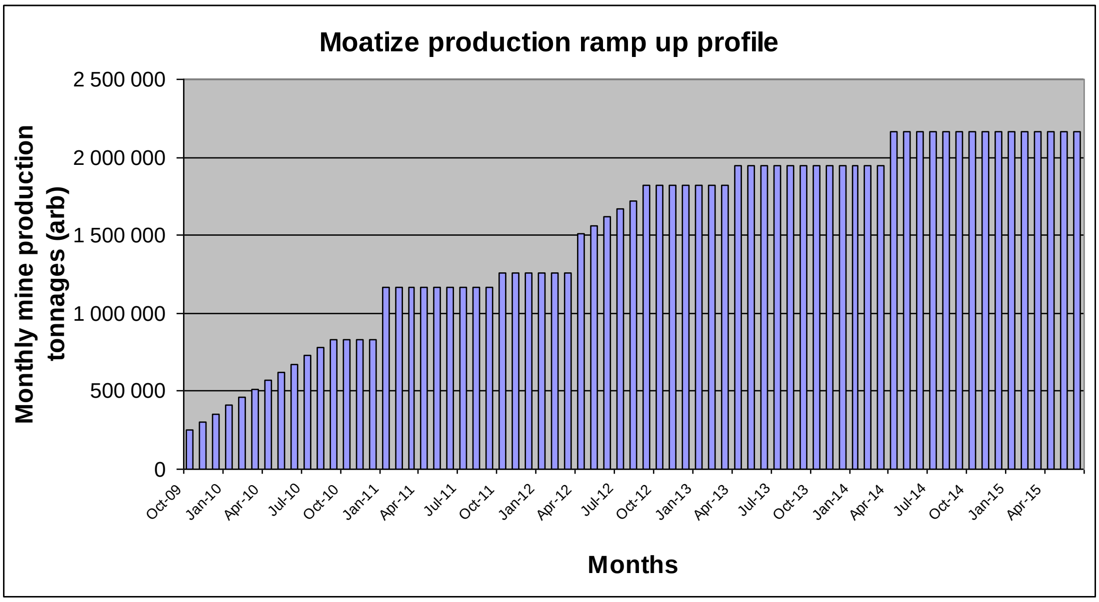

Figure 14: BFS Coal Ramp-up Profile

There are four different areas affecting the integrated ramp-up at Moatize.

- Mining
- Processing Plant
- Marketing
- Rail & Port Infrastructure

The mine design offers upside mining rate opportunity because the scale and location of the scheduled pit reserves affords space to open up additional working faces and engage additional equipment and resources.

Golder has not sighted a modified mining materials movement plan and equipment fleet schedule supporting a faster ramp up, and cannot comment directly on the achievability of such plans. The variation proposed affects only the ramp-up period, until 2014, after which the schedule mirrors that described in the BFS.

Golder believes that the BFS materials movement and operational fleet plan of 2006 was based on sound engineering planning methods.

Moatize has implemented intensive employee training programs, including use of training simulators and placement of personnel at Vale's mine sites in Brazil. This is aimed at achieving the high standards prescribed for the 4.5 year ramp-up.

A 3.5 year ramp up to full production would entail an incrementally earlier mobilization of equipment and labour and therefore an additional degree of focus to ensure development of the necessary skills base at Moatize.

The processing plant is not likely to be the bottle-neck as once it is constructed it should have capability to run at the full 26 Mtpa rate. During ramp-up it will be under-utilised.

Vale informs Golder that marketing of Moatize coal is under way and although it has a number of Letters of Intent, there are firm contracts for only 0.5Mt. The cash flow for this reserve report is calculated under the assumption that Vale will develop a customer base as planned for the Moatize coking and thermal coals.

Coking coal product quality is expected to be relatively high ash at 10.5% (adb). Perhaps more significantly, it is also relatively high phosphorous, averaging just under 0.06% for the life of mine, and ranging as high as approximately 0.09% in the first five years. Golder notes this as a significant risk in securing buyers for the planned coking coal quantities. However, Vale has made presentations to a large number of users who in general have been happy with the specification. This will be subject to bulk sample testing and trial shipments once CHPP begins production.

Export coal product ash is 23% (adb) for the 27.2 GJ/tonne thermal product. This is considered to be slightly high in thermal coal markets, though it may be partially offset by the high calorific value. This may also present a market risk. However, Vale believes this is a very suitable product for shipment to India.

The greatest limit to ramping up production may be the infrastructure at both the rail and at the Beira port facility. Moatize's mitigation plans include arranging for additional rolling stock and locomotives for the coal haul and a refurbishment of the port costing $35 million, both funded by Vale. This is beyond the costs allowed for in the feasibility plan, under which the improvements were to have been funded by rail and government authorities. This additional expenditure is expected to enable shipping up to a total of 6.0 million product tonnes per year.

Further upgrades are required to achieve the necessary 12 Mt/a capacity. This work is still planned to be funded and accomplished by others. Timely completion of rail and port upgrades continues to present a risk to the project.

Vale states that remaining coal to port haulage risk is provisionally planned to be mitigated by a truck haul to an alternate rail line in Malawi for haulage to the separate Nacala port facility. Line and equipment upgrades for the Nacala plan entail an additional cost depending on the final determined upgrade capacity. This study is currently ongoing in conjunction with other studies for the site.

There is 600 000 tonnes stockpile capacity at the rail head and 500 000 at the port. This is less than a month's capacity at the rail head and approximately half month at the port, and may therefore limit Vale's ability to blend to achieve customer product specifications.

In the end the product quality is reasonable and provides a different source for users from the standard Australian and South African sellers. The chances are that as long as Vale can produce coal at the planned specifications the coal will be sold. There exists some uncertainty associated with coal sale price. Vale has assumed a 3% discount on the forecast Hard Coking Coal (HCC) price

Marketing is a risk to the Reserves but Vale is a strong company with excellent contacts and links around the world and should be able to secure suitable markets for its production.

3.6 Mine Services

The mine services will be located near the CHPP area between Section 2A and Section 1. The main ROM pad and Primary crusher will be located to the SE of the rail loop with a conveyor linking it and the main preparation plant. A haul road capable of handling up to 300 t trucks is being built to link the ROM with the Section 2A boxcut.

The main mine services will consist of:

- Workshops capable of taking 300 t haul units with sufficient space around them so that they can be easily extended.
- Fuel and lube station near the truck park up area capable of very fast refuelling and lubrication.
- Wash bay facilities.
- Tyre bay (run by external contractor).
- Explosive storage facilities run by an external contractor who will provide down the hole services.
- Park up area for equipment.
- Mine office facilities and muster areas.
- Canteen.
- Change house.
- Laydown area for equipment.

Figure 15 shows construction under way at the CHPP and mine services area with the equipment laydown area in the foreground.

Figure 15: Construction of CHPP and Mine Infrastructure Underway

Golder finds the mine services area layout and facilities to be suitable for the likely operations at Moatize.

3.7 Coal Quality

The plan is now to mine in 10 m bench with the coal mined as two 5 m flitches. The coal will be lightly blasted with the aim to allow easier digging but while keeping it in place. The blastholes will be geophysically logged to determine seam and ply information before mining to control blending from the pit. This is a practise followed at a number of mines in South Africa.

Golder considers this a reasonable method for the size of operation and the geometry and consistency of the coal quality.

Vale intends the use MMS® equipment and materials movement tracking systems at Moatize. Effective implementation of this type of system can be a key component of future reconciliation of reserves. As such it will compliment other coal quality work

Table 13 gives a summary over the mine life of the estimate ROM and product coal qualities. The ash level for the coking coal is slightly high but was considered to be the optimum for yield while still providing a good product.

The thermal coal has a good specific energy (SE) value but is slightly high in terms of the ash (23%). This is an export product coal. A lower SE could be produced from the plant which may be suitable for local uses such as a site power station.

Table 13: Coal Quality over Mine Life

Item	Unit	ROM (arb)	ROM (adb)	Coking Product (adb)	Thermal Product (adb)
Tonnage (Mt)	Mt	870.8	838.3	267.5	67.6
Specific Energy	MJ/kg	17.34	18.01	32.13	27.20
Moisture	%	4.57	0.87	0.81	0.81
Ash	%	35.66	37.05	10.50	22.83
Sulphur	%	3.90	4.05	1.00	0.93
Volatile Matter	%	16.00	16.62	21.01	18.14
Relative Density	t/m^3	1,62	1.68		
Practical Yield	%			31.9	8.1

3.8 Mine Recovery (Mineability) and Dilution

Based on consideration of other operational experience it was decided to use a mining loss of 6% (5% for losses at top and bottom of the seams and 1% at the strip edge). These losses were added to the waste.

Section 6 and Section 1 are known to have had underground workings in the Lower Chipanga Seam. Allowances for underground workings were made in the Resource model in terms of tonnage loss but no allowance was made for the potential dilution when mining though worked out areas. However, the additional dilution is unlikely to have a significant effect on the total reported reserves.

Allowances were also make for coal lost around dykes due to burning (20-50 m). This is possibly conservative as one rule of thumb is a loss of the thickness of the dyke and most of the dykes are narrow. However, this probably makes up for areas where the dykes have not be modelled but will be encounter anyway.

The air dried basis *in situ* tonnes and grades are converted to as received basis for ROM feed. A moisture allowance of 3.7% is added to the in-situ tonnes to convert them to ROM (arb). This is based on Hunter Valley experience.

Dilution will depend on the size of equipment used and the bench height. In other words, with larger excavators is more difficult to stay on the mining horizon or geological contact. It is however only a problem on the upper and lower contacts of the seams. Golder understands that Moatize wants to mine across the dip of the seams, like they have done in the bulk sampling. This could have the effect that a little more dilution will take place than anticipated.

Golder believes that the dilution and mining loss allowances are reasonable.

The yields within the model from the slim line drilling were corrected using a factor to convert them to a practical yield using a factor of 0.92. This was estimated from 14 LD vs. slim line sample yields using holes close to each other. The factors estimated were actually 0.8 for coking and 1.04 for thermal which were simple averaged to 0.92. This is however incorrect as they should be weight averaged for the product (i.e. 3 times coking to 1 thermal would give a factor of 0.86).

The correction factor used for converting slim core yield to practical yield may be overestimating product coal by 7% particularly for the saleable coking coal.

The method used can be improved upon and it is understood that for the 2009 work that LIMN modelling was used.

No additional dilution has been added to that already included in the geological model. It was felt that as the seams were thick and that some dilution internal dilution was already included that this was sufficient.

A safety limit of 500 m was allowed around the Moatize village to the crest of the pit. There is potential to reduce this and increase the Reserve base.

3.8.1 Mine Scheduling

The scheduling was carried out in XPAC, an industry standard software package for mine production scheduling. The mine designs included access ramps into the pits but no allowance were made for detailed design and ramp access internally in the pit area.

The process was to accumulate the mining inventory of coal and waste by 300 m by 150 m blocks (smaller blocks for the 2009 2A study) to represent coal strip mining layout.

Each block was assigned a section, location, coal seam, grades and other variables. This data was exported from Surpac into XPAC.

Coal affected by intrusion was treated as waste with only Measured and Indicated material considered as plant feed.

The schedule was developed manually using 26 Mt/a ROM as the target. From the resultant waste and coal quantities a mining fleet was estimated

Scheduling was for 35 years with the first 3.5 years scheduled monthly the next three quarterly and the remainder yearly.

Figure 16 gives an example of the layout of scheduling blocks for Section 1.

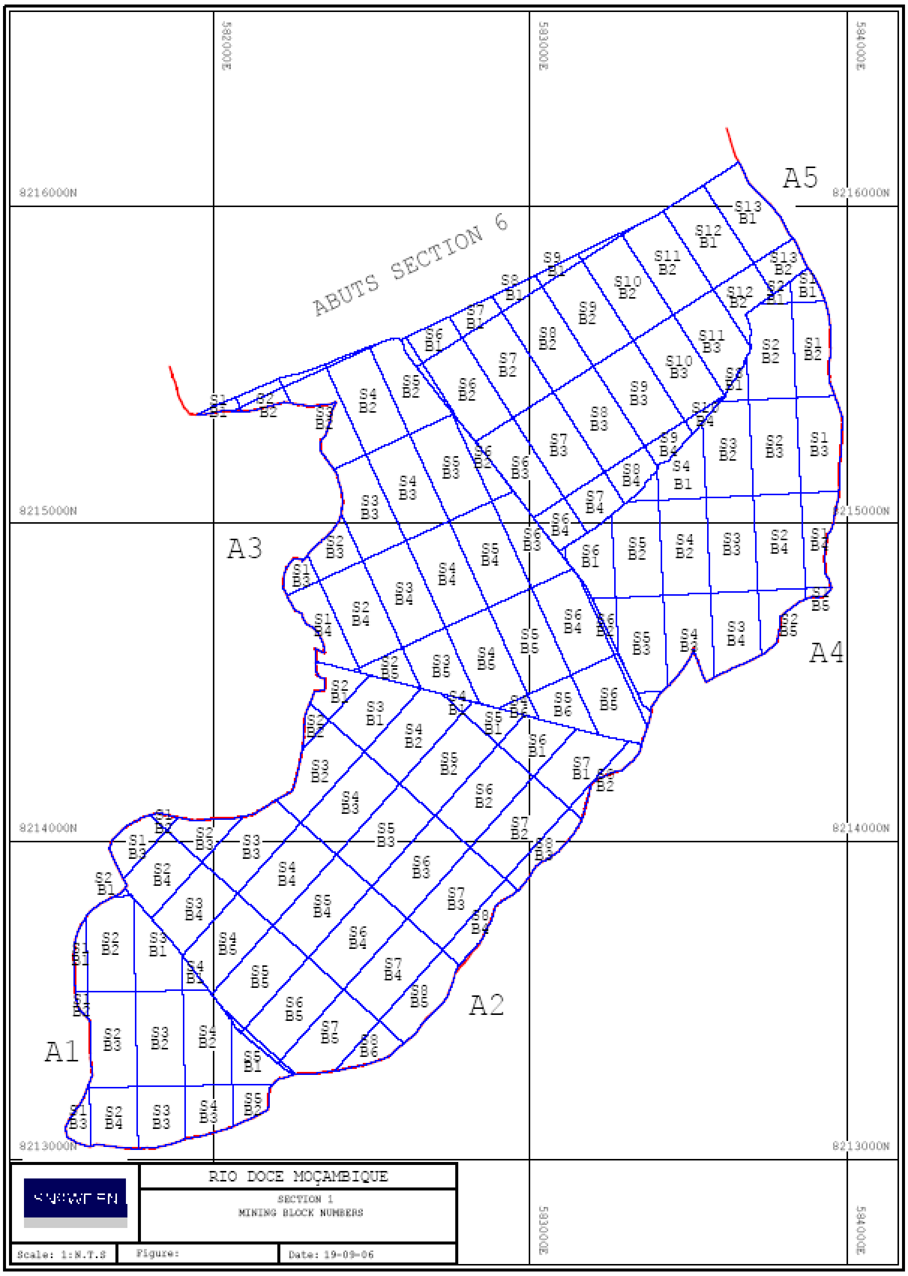

Figure 16: Example of scheduling Blocks used in Section 1

Figure 17 shows the progress of the BFS mining for the period for the first 15 years.

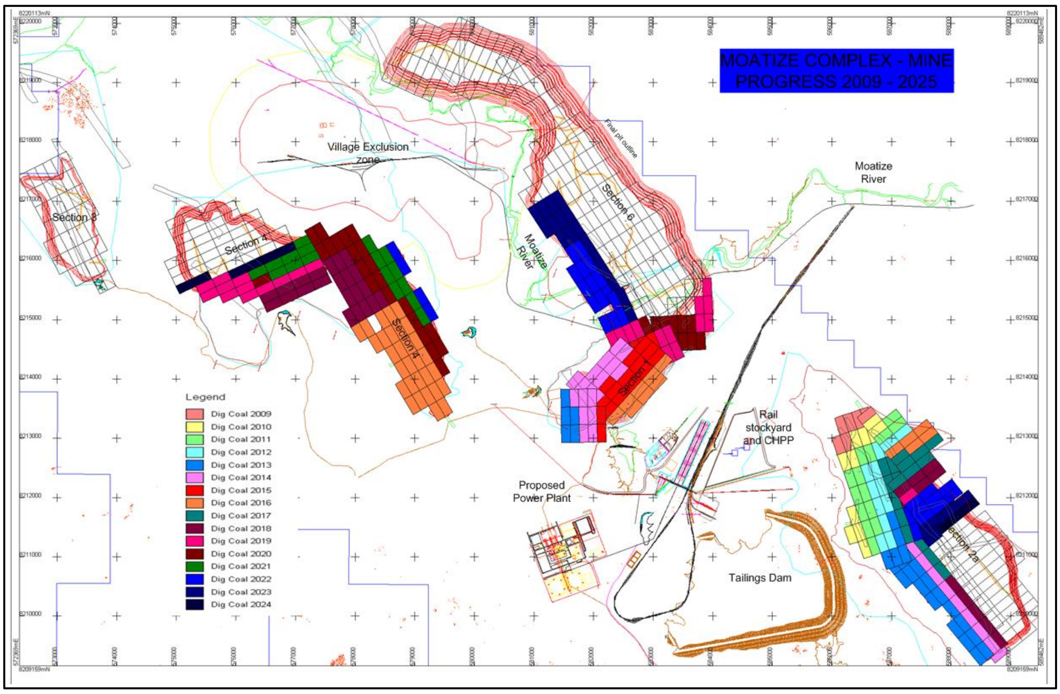

Figure 17: Sample Face Positions at 2024

Table 14 gives the BFS LOM summary production. The prime strip ratio (waste removed from the pit) is 1.95 bcm/t while the effective strip ratio (waste from pit plus rehandle and coarse rejects from the plant).has a strip ratio of 2.25 bcm/t.

The haul back of reject adds a large amount of extra material to be handled by a truck fleet. For the BFS a separate haulback fleet (150 t units) was considered. However, Moatize is now considering using the mine fleet with its bigger trucks to carry out the haul.

Figure 18 gives an example of the more detailed planning carried out for the 2009 work on Section 2A. The figure shows the face position, floor external dump development and major access roads at the end of 18 months. This is important in showing the feasibility operational development of the pit.

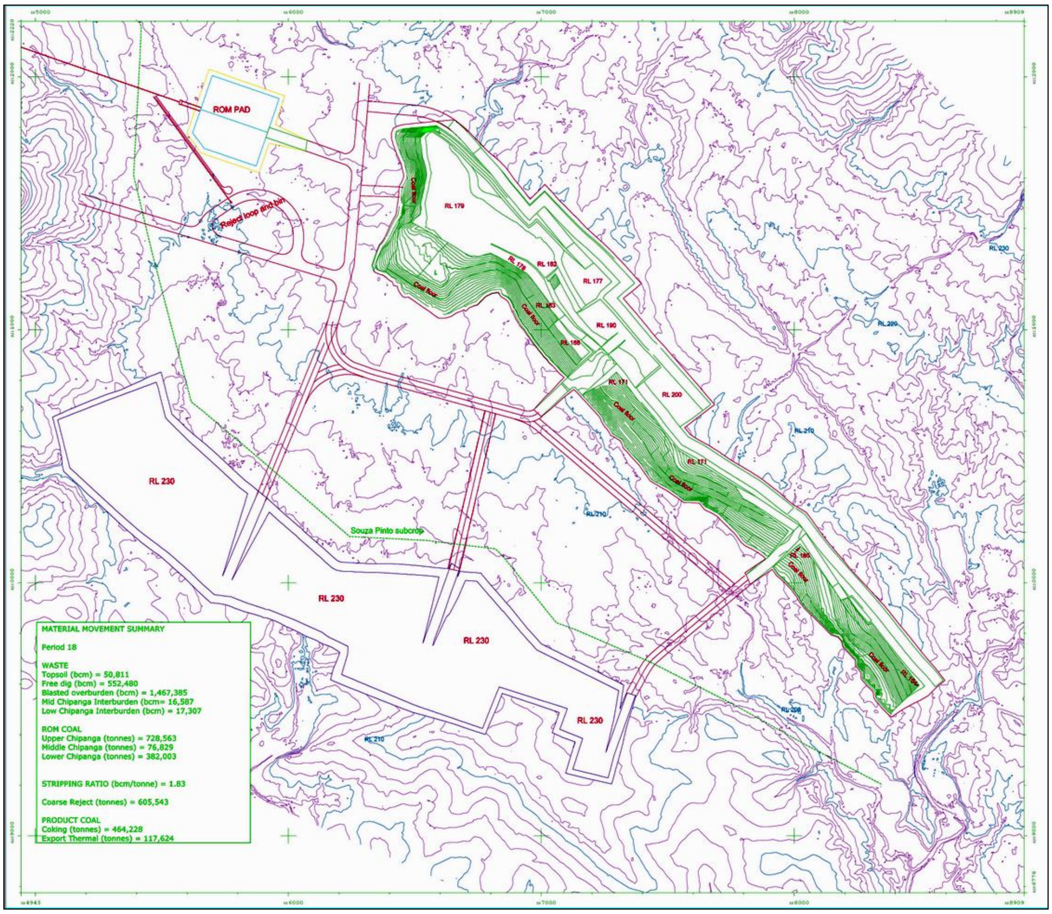

Figure 18: 18 Month Plan for Section 2A

Table 14: Summary LOM Production

ROM (arb)	**Mt**	**870.8**
Topsoil	Mbcm	6.8
Prime Waste	Mbcm	1559.5
Rehandle (3%)	Mbcm	46.8
Burnt Coal (waste)	Mbcm	113.3
Inferred Ore (waste)	Mbcm	14.6
Coarse Reject	Mt	504.8
Coarse Reject	Mbcm	219.5
Total Effective Waste	Mbcm	1960.5
Total Prime Waste	Mbcm	1694.2
Effective SR	bcm/t	2.25
Prime SR	bcm/t	1.95

Golder finds that the scheduling has been carried out to appropriate standard using industry standard software.

3.9 Conversion of Resource to Reserve

The Moatize Mine Coal Reserve estimate was updated as at June 2009. The reserve was calculated by Snowden Mining Industry Consultants Pty, and based on a resource, mine plan and schedule also produced by Snowden. The Reserve report, dated 27th October, 2009, appears in Appendix B. Accelerated mining plans introduced since the reserve report was published do not affect the reserve itself.

Table 15 compares the 2006 and 2009 published Reserves. Golder notes that there appears to have been an error in the statement of the 2009 ROM coal Reserve on an arb basis (Snowden 2009b). The statement shows a total Reserve of 954 Mt (adb) and 1071 Mt (arb). Golder believes that the Section 2A Probable Reserve on an arb basis should be 120 Mt not the 195 Mt as shown in the report. None of the other figures would change except that the ROM Probable and total Reserves for 2009

Table 16 compares the corrected figures for 2009. The Proven Reserves have not changed since 2006, the only difference is in the Probable Reserves.

Table 15: Comparison of Published 2006 and 2009 Reserves

Reserves at 21 December 2006						
	ROM		**Coking**		**Thermal**	
	Mt adb	**Mt arb**	**Mt adb**	**Mt arb**	**Mt adb**	**Mt arb**
Proved	422	438	143	157	34	36
Probable	416	432	125	138	34	35
Total	**838**	**870**	**268**	**295**	**68**	**71**
Reserves at 30 June 2009						
	ROM		**Coking**		**Thermal**	
	Mt adb	**Mt arb**	**Mt adb**	**Mt arb**	**Mt adb**	**Mt arb**
Proved	422	443	141	155	33	35
Probable	532	629	169	185	45	48
Total	**954**	**1071**	**309**	**340**	**79**	**83**

Table 16: Comparison of 2006 and Corrected 2009 Reserves

Reserves at 21 December 2006						
	ROM		**Coking**		**Thermal**	
	Mt adb	**Mt arb**	**Mt adb**	**Mt arb**	**Mt adb**	**Mt arb**
Proved	422	438	143	157	34	36
Probable	416	432	125	138	34	35
Total	**838**	**870**	**268**	**295**	**68**	**71**
Reserves at 30 June 2009						
	ROM		**Coking**		**Thermal**	
	Mt adb	**Mt arb**	**Mt adb**	**Mt arb**	**Mt adb**	**Mt arb**
Proved	422	443	141	155	33	35
Probable	532	554	169	185	45	48
Total	**954**	**997**	**309**	**340**	**79**	**83**

The 2009 Reserves are based on the 2006 Resource Model (CVRD 2006). Reserves were reported according to the SAMREC code of March 2000.

Table 17 compares the 2006 and 2009 Reserves by mining section. The 2006 reserves shown here represent the totals within the pit designs as reported (Snowden 2006c) rather than the published reserves, which simply dropped the last two years of production in the pits to give a 35 year life. Comparison shows that there are only minor changes in most sections. It is not exactly clear that there are differences in Sections other than 2A (probably due to use of different software packages and tabulations), however the differences are insignificant and do effect the validity of the 2009 Reserves.

Table 17: Comparison by Sections

	2006 In-Situ Mt (adb)	**2009 in-Situ Mt (abd)**
1	111	125
2a	192	188
3	45	60
4	161	191
6	385	391
Total	894	954

Since June 2009, Vale has proceeded with the project and construction is well under way on-site.

- The plant is expected to be operational mid 2011 with the first coal shipment about August 2011.
- Mining equipment is already on-site with the start-up of the initial box-cut to start immediately.
- Regulatory approvals are in place.
- The Mining contract has been completed with government authorities. Terms include agreement for payments of royalties, tax, “Free Carry terms” and reclamation guarantee
- Additional rolling stock has been sourced and the initial rail line and port upgrade at Beira port is nearing completion.
- Further drilling has continued for a potential expansion project within the present concession.

Golder sees no particular impediment to the achievement of these goals at this time.

In preparing coal reserve data, Vale used price assumptions that did not exceed the following (2007 to 2009) historical average prices (based on realized sales or reference prices): for hard metallurgical coal for Moatize reserves US$175 per metric ton (hard coking coal FOB Australia reference price).

Golder supports the Coal Reserves as given in Table 18***. These are corrected for the tabulation error discussed above.***

The full statement by Snowden and the SAMREC criteria as they apply to the Project Coal Reserves are included in Appendix B.

Table 18: Coal Reserves at June 2009

Section	Class	ROM Coal	ROM Coal	Saleable Coking Coal	Saleable Coking Coal	Saleable Thermal Coal	saleable Thermal Coal
		Mt (adb)	Mt (arb)	Mt (adb)	Mt (arb)	Mt (adb)	Mt (arb)
				(10.5% Ash)			
1	Proved	78	82	28	31	7	7
	Probable	47	47	16	17	5	5
2A	Proved	73	76	25	28	4	4
	Probable	115	120	40	44	7	7
3	Proved	56	59	15	17	4	4
	Probable	4	4	1	1	0	0
4	Proved	150	157	54	59	14	15
	Probable	41	43	14	15	4	4
6	Proved	66	69	18	20	4	4
	Probable	325	340	98	107	29	31
Total Proved		423	443	140	155	33	34
Total Probable		532	554	169	184	45	47
Total Reserves		955	997	309	339	78	81
Notes	ROM(arb) assumes mositure added to give 4.6% total moisture						
	Coking Coal Product (arb) assumes moisture added to give 10% total moisture						
	Thermal Coal Product (arb) assumes moisture added to give 6% total moisture						

3.10 Processing

The coal handling and processing plant (CHPP) is described in ESSJV (2006) and its planning was part of the BFS process.

The Moatize deposit is potentially a difficult coal to process. The coal contains high levels of vitrinite, good rank, which can produce very strong coking properties. However, on the negative side the product will contain a high level of ash.

Extensive use was made of plant computer simulations benchmarked against actual operating practice to select the most appropriate circuits for Moatize. The simulations used data from large diameter core (LD) treated to Australian standards to emulate the likely degree of breakage occurring in practice.

The design uses two stage dense media cyclones (DMC) for the coarse coal together with spirals and flotation cells for the fine coal. The coarse product coal from the low density DMC circuit is combined with the vitrinite rich fines for a nominal 10.5% coking coal product. The coarse middlings from the higher density DMC circuit are used to create a secondary thermal product.

The plant is planned to handle 26 Mt ROM coal (arb) while producing two products simultaneously, namely a coking coal of 10.5% ash and thermal coal which can range in quality from a minimum of 22 MJ/kg through to 27.2 MJ/kg for domestic power and export consumption respectively. The coal is relatively low yield with the coking coal averaging a practical yield of about 32% and an export thermal product averaging 8%.

The base case of the CHPP facilities for the FS consisted of the following:

- Two remote 4 000 t/h ROM dump stations. The implementation phase has removed one station;

- A 500 tonne surge bin;
- Two parallel 2 000 t/h sizing stations each comprising two stages of sizers with intermediate screening to minimise the required size of the tertiary sizers and the generation of fines;
- Twin 2 000 tonne crushed coal surge bins, each of which will feed two CPP modules;
- A 4 000 t/h coal processing plant consisting of four 1 000 t/h modules each contained two stages of dense medium cyclones (DMCs), spirals and Microcel (changed to COT as part of the implementation) flotation cells;
- The DMC modules will be in a pre-scalp configuration whereby the rejects will initially be removed in a high density cut point to allow the critical low density coking coal split to be carried out more efficiently with lower feed and rejects loadings;
- Horizontal vibrating baskets will be used for dewatering the coarse coal, scroll type centrifuges for the spirals product, and horizontal belt filters with chemical dewatering aids for dewatering the flotation concentrates;
- Twin linear stockpiles of 800 000 tonne total live capacity will be provided (reduced to 600 000 t at implementation), each with a dedicated stacker rated for 2 400 t/h. The stockpiles will be divided into a number of zones, and either coking or export thermal product may be directed to either stacking line to suit the production needs for product blending as market requirements change;
- Coal will be reclaimed for train load-out using a single bucket wheel reclaimer rated for an average 4 500 t/h;
- The train loading station is rated for an average 4 500 t/h (5 000 t/h max), with the coal to be reclaimed by a bucket wheel reclaimer. The bin capacity will be 400 tonne and flask loading used to ensure loading accuracy;
- Coarse rejects, including dewatered spiral rejects, will be conveyed to a bin and hauled by the mining department back into finished pit areas;
- Fine tailings will be thickened and pumped out to a conventional tailings dam; and
- A centralised CHPP control room and electrical switch room.

Capital estimate was for $363M.

Table 19 summarises the LOM operating costs for the CHPP estimated as part of the FS.

Stockpiling consists of 500 kt at the ROM (about 2 weeks) and 600 kt of product at the rail loadout. The basic plan is for coal to be fed directly to the plant with blending being carried out from the pit.

It will be difficult for the mine to operate as a bulk high production operation and as a more selective coal mine in some areas without some problems.

Golder believes that it may be possible to achieve the best of both a high production with some more selectively mined areas for product improvement but this is likely to be at the cost of more equipment and therefore higher cost to allow for loss of production and the need for greater selectivity.

Table 19: FS CHPP operating Cost:

Item	LOM $/t ROM	LOM $/t product
Labour	0.20	0.48
Power	0.29	0.69
Water	0.00	0.00
Reagents/Consumables	0.26	0.62
Maint supplies	0.55	1.31
Consultants	0.02	0.05
Sampling& testing	0.01	0.02
Sub-total	1.33	3.16
Contingency	0.13	0.32
Total	**1.46**	**3.48**

The plant is presently being constructed with hot commissioning planned for February 2011 and production for June/July 2011. Figure 19 shows the processing plant under construction in June 2010.

Figure 19: Processing Plant under Construction – June 2010

The plant design has been designed using proven technology and experienced process engineers.

It has flexibility to produce different products and can operate each plant module separately.

The CHPP design and process selection appears to be appropriate for the Moatize coal deposit and the style of operation envisaged by Vale.

4.0 ECONOMIC ANALYSIS

The Vale June 2010 cost model was audited during a meeting at the Johannesburg Vale offices on 21 June 2010. The model shows a fairly robust internal rate of return and profit within a project payback of 7 years. The revenue model assumes a discounted coal sale price due to coal quality of:

- 3% for hard coking coal.
- 22% for export thermal coal.

A domestic thermal coal scenario was not modelled.

The revenue model is considered reasonable. Golder considers the hard coking coal sale price may be slightly optimistic for the first few years for an untried brand. Later years were more conservative and there exists some upside.

4.1 Life of Mine Plan

The Life of Mine plan (LOM) remains unchanged with that presented in the BFS from years 5 to 35. The first five years of the plan was updated in the current vale budget 2010-2015 to reflect the delayed start date and ramp up using the modified truck and excavator fleets.

Golder considers the LOM plan productivity assumptions achievable and calculated to an appropriate level of detail.

The ramp up schedule of 4.5 years is considered achievable given that Vale is a large mining company with well established technical standards and operating procedures. The ability to meet production targets will depend on a smooth transition from feasibility mine design to production.

4.2 Cost Estimates (Mining, Processing, G&A, others)

Golder reviewed the 2010 cost estimates at a high level. Golder has not sighted detailed calculation data. A summary of the June 2010 Budget costs in comparisons to the IBFS is included in Table 20. Capital costs generally increased in comparisons to the IBFS. The logistics category was the highest to date with an additional $125M spent on rail/port transport costs. In addition the delayed project start date resulted in increased capital costs for some of the equipment generally due to escalation clauses in the contract or unfavourable changes in exchange rate.

Operating costs per product tonne also generally rose with logistics again being the most significant. A rise in diesel cost and additional power costs attributed to the increases. The mining cost per tonne of total material moved remained fairly consistent at $1.55/t.

Site personal and labour were in general consistent with the IBFS. A total of 750 staff is budgeted for 2011 ramping up to 893 by 2015.

Table 20: 5 Year Summary of Unit Costs ($US/product tonne)

Area	IBFS	Budget 2010
Mine	13.58	17.74
CHPP	3.20	4.66
Infrastructure	0.45	0.83
Logistics	12.43	31.64
Administration	4.81	5.84
Total	**34.47**	**60.71**

Golder considers the cost model assumptions used to be reasonable.

4.3 Cash Flow Model and Sensitivity Analysis

Updated cash flows were completed for year 1 to 5 only. The updated cash flows were calculated using methods similar to those discussed in the BFS of 2006.

In preparing coal reserve data, Vale used price assumptions that did not exceed the following (2007 to 2009) historical average prices (based on realized sales or reference prices): for hard metallurgical coal for Moatize reserves $175 per metric ton (hard coking coal FOB Australia reference price).

Golder considers the financial model assumptions used to be reasonable and the cash flow model to be well constructed and to a high standard.

Golder did not sight any sensitivity analyses done by Vale during the audit. However, the original BFS costs and revenues were roughly compared to the 2010 budget cash flow model. Although costs have increased the coking coal price has risen significantly from 66$/t to the long term average of $160/t.

5.0 CONCLUSIONS

The conclusions from the individual sections of the report are bought together below.

Golder finds the Coal Reserves documentation and data put together to a good standard. The Reserves are based on two main studies. These are the 2006 BFS (Snowden 2006c) and the 2009 update (Snowden 2009a and 2009b). The BFS provides the basis for all the Mining Sections except 2A. The plan was updated for this Section in 2009 with extra holes and more detailed planning for what will be the initial mining area.

Golder believes that the Resources and Reserves are fully supported by the work and studies carried out to date. There are aspects however that could be improved and these are covered below.

The main problem has been a lack of solid audit trail at this time. This is not because the work and data is not available but because Moatize is in a transitional period between the Feasibility and implementation planning carried out by Snowden and the operational planning that is now being taken over by the Moatize staff on site.

These on site people will in the next year no doubt redo much of the work and hopefully produce a new set of Reserves which will be fully documented and backed up by their own work.

During this work it is important they create a proper audit trail (Appendix A).

Construction of the CHPP and other mine infrastructure are well underway, so risk in these areas are rapidly reducing. Much of the initial mining equipment is already on site and is now operating in the box-cut.

Golder believes that the Reserves published at June 2009 and as given in Table 18 are reasonable and supportable.

5.1 Conclusions

Golder believes that the drilling and core logging procedures and methodology were of a high standard and suitable for development of a geological model and Coal Reserves.

Golder is of the opinion that the wash table fractions and analysis is adequate for Coal Reserves and coal quality estimation.

Although there was some minor errors in the geological database, Golder believes that it is suitable as a basis for estimation of Coal Resources and subsequently Coal Reserves.

Golder found in validating the BFS reserves with those currently in use at site that there was no clear audit path between them. However Golder does not believe this effect the Coal Reserves as published in 2009.

Golder concurs with the selection of a truck/shovel system.

Golder believes that the scheduling parameters and ramp-up are aggressive but achievable.

Golder believes that the water management strategy is appropriate for the operation.

The waste dump design parameters are reasonable and Golder supports their use.

Golder believes that there is no particular reason why the mix of in-pit and out of pit dumps cannot be used to handle the waste from all the sections plus the coarse rejects from the preparation plant.

The mine design parameters are reasonable industry standards and Golder concurs with their use.

Golder believes that the wall design is appropriate for the level of study.

Highwalls that intersect underground workings in Sections 1 or 6 may need a reduced slope angle.

Golder finds the mining method and equipment selected suitable for the operation.

Golder considers this to be all industry standard equipment from good suppliers and see no particular problem with the equipment selection.

Golder has sighted detailed equipment productivity calculations supporting the planned BFS primary production fleet, and finds the assumptions and methods of calculations used for equipment fleet and cost projections to be reasonable.

Marketing is a risk to the Reserves but Vale is a strong company with excellent contacts and links around the world and should be able to secure suitable markets for its production.

Golder finds the mine services area layout and facilities to be suitable for the likely operations at Moatize.

Golder considers the coal mining and quality control methods planned to be used are reasonable for the size of operation and the geometry and consistency of the coal quality.

Golder believes that the dilution and mining loss allowances are reasonable.

The correction factor used for converting slim core yield to practical yield may be overestimating product coal by 7% particularly for the saleable coking coal.

Golder finds that the scheduling has been carried out to appropriate standard using industry standard software.

Golder supports the Coal Reserves as given in Table 18***. These are corrected for the tabulation error within the reported Snowden Reserves.***

Golder believes that it may be possible to achieve the best of both a high production with some more selectively mined areas for product improvement but this is likely to be at the cost of more equipment and therefore higher cost to allow for loss of production and the need for greater selectivity.

The CHPP design and process selection appears to be appropriate for the Moatize coal deposit and the style of operation envisaged by Vale.

Golder considers the LOM plan productivity assumptions achievable and calculated to an appropriate level of detail.

The revenue model is considered reasonable. Golder considers the hard coking coal sale price may be slightly optimistic for the first few years for an untried brand. Later years were more conservative and there exists some upside.

Golder considers the LOM plan productivity assumptions achievable and calculated to an appropriate level of detail.

Golder considers the cost model assumptions used to be reasonable.

Golder considers the financial model assumptions used to be reasonable and the cash flow model to be well constructed and to a high standard.

REFERENCES

CVRD, 2006, *Geological Exploration Report Moatize Coal Project*, October 2006.

ESSJV, 2006, *Coal Handling and Preparation Plant Feasibility Study – FEL3 Report Final (02_RL_6000_G_002)*, ELB, Sedgman , Semaine JV, 27 September 2006.

Golder, 2006*, Pre-Feasibility Geotech Data Collection and Analyses for Preliminary Open Pit Mine Slopes - 7522-8262_23G,* Golder Associates.

HKEx, 2010. Amendments to the Rules Governing, the Listing of Securities on The Stock Exchange of Hong Kong Limited, Chapter 18.

HkEx, 2010. *Suggested Risk Assessment for Mineral Companies*, Guidance Note 7 to Rules Governing the listing of Securities, Issued under Rule 1.06 of the Exchange Listing Rules, p18-20.

JORC, 2004. *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code)*. Prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC), effective 17 December 2004.

Leite, A.A. da Silva, Graca, J.L., 2006, *Technical Report QA/QC program*, CVRD, April 2006.

SAMREC, 2000. *The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (The SAMREC Code – First Edition)*, The South African Mineral Resources Committee (SAMREC) Working Group, March 2000.

SAMREC, 2007. *The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (The SAMREC Code)*, The South African Mineral Resources Committee (SAMREC) Working Group.

SAMVAL, 2008. *The South African Code for the Reporting of Mineral Asset Valuation*, The South African Mineral Asset Valuation Committee (SAMVAL) Working Group, Johannesburg.

Snowden, 2006a, *Moatize Resource Modelling (060908_Final_JR003-09-2006_CVRD_Moatize_Resources_Modelling)*, Snowden, September 2006.

Snowden, 2006b, *Moatize Project Resource Statement (060911_Final_JR002-09-2006_CVRD_Resource_Statement)*, Snowden, 7 September 2006.

Snowden, 2006c, *Moatize Project Engineering Report (061211_final_5341_RIOMOC_Moatize.doc)*, Snowden, December 2006.

Snowden, 2006d, *Moatize Resources for Feasibility Study (CVRD_Resources_Memo_3_April_2006.doc)*, Snowden, April 2006.

Snowden, 2007, *Moatize Coal Project Detailed Engineering Design – Initial Dump Study)*, Snowden, October 2007.

Snowden, 2009a, *Geological Model and Coal Resources (090626_n_Draft_RIOMOC_2A_Model_R.docx)*, Snowden, June 2009.

Snowden, 2009b, *Moatize Mine Coal Reserve Estimate as at June 2009, (090626_Final_6075_RIOMOC_Moatize_ResStat_R.pdf)*, Snowden, 27 October 2009.

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APPENDIX A

Reserve Audit Guideline

Reserve Audit Guideline

In order to improve the audit trail Golder suggests that Vale Moatize consider establishing a standardized reserves reporting protocol that includes the archiving of a single complete and auditable reserves reporting package. This would enhance the auditing process and form the foundation of future continuous improvement efforts for reserves calculations and reporting.

Framework:

As part of routine validation of the Moatize reserves, Golder is obliged to confirm that the following items are the result of sound engineering and geological practise, and that the final estimations are compliant with reporting codes such as SAMREC, SEC Industry Guide 7, HKEx Chapter 18, or NI 43-101, as required.

a) The Resource Model.

b) The Mining plan that is based on those resources.

c) Reserves Statement.

d) The positive cash flow resulting from the mining plan.

e) Vale's sensitivity analysis on the cash flow, concluding that the project is robust under reasonably expected market conditions.

Among other things, we must validate sufficient financial data to support Vale's conclusion that that the mine as planned and scheduled, can reasonably be expected to be profitable.

The reserves report package should be archived in an established permanent standard location, and included a summary document sufficiently detailed to enable consistent replication of the reported reserves. This document would include:

1) Reference to a uniquely named and dated copy of the Vulcan (or other) model used to generate the reserves.

2) Reference to a uniquely named and dated copy of the Whittle model used to guide pit design.

3) Reference to uniquely named and dated Whittle shells.

4) Reference to uniquely named and dated set of pit design solids or surfaces, plus any relevant topographical surfaces.

5) A detailed description of the methods and constraints used to calculate the reserves.

6) A Life of mine Project Cash Flow, complete with a clear list of underlying practical and economic assumptions.

7) Reference to the detailed Life of Mine Plan upon which the Project Cash Flow is based.

8) This should include a full set of project design, and scheduling files, complete with underlying assumptions.

9) Underlying assumptions and key inputs should clearly show how figures were sourced or calculated from first principles.

10) Discussion of any variance from previous plans.

11) A sensitivity analyses on costs and revenues.

12) Equipment purchased/purchase plans versus feasibility plans.

13) The auditor will require access to sufficient detail on each line item in the cash flow to demonstrate how the numbers have been derived. The auditor must be able to "drill down" into cost figures or

assumptions to demonstrate that a reasonable standard of care has been used to generate the cash flow components. Typically the auditor would sight cost work-ups and check cost components sufficient to represent the required standard of care.

Example of the level of detail required:

First level: Budget line items would be traced to a Mining cost per tonne under headings such as:

- Total revenues traced back to mine plan product quantities and prices per tonne received
- Total expenses broken down to component categories
- Overburden Mining $/tonne
- Coal Mining $/tonne
- Coal Processing $/tonne
- General and Administrative $/tonne
- Costs and productivities would be derived from first principles for a new project without a cost history
- Costs and productivities would be calculated from accurate operational statistics for a project with sufficient operating history
- In all cases, underlaying assumptions and figures must be apparent and calculations re-produceable

Second level: The above headings should be traceable through their component parts to sub-category costs. Example of mining costs

- Haulage $/tonne
- Drilling and Blasting $/tonne
- Loading $/tonne

Third Level: Example using Haulage cost/tonne. Should be traceable through to number of haul trucks used and haul hours required, and then to the first principles detail that adds up to operating cost per hour of the haul trucks.

APPENDIX B

Moatize Mine Coal Reserve Estimate as at June 2009

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27th October 2009

Mr Galib Chaim
Director
Rio Doce Mozambique LDA
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7, 8 Floor Centro Cimpor
Maputo, Mozambique

Dear Galib

MOATIZE MINE COAL RESERVE ESTIMATE
AS AT JUNE 2009

Snowden are herby updating the Moatize mine reserves as were previously released (21st December 2006) after completing a FEL 4 – "Pre – Implementation" study, which was finalized in June 2009.

Snowden has been requested to provide a person who will accept competency for particular aspects related to the presentation of these estimates. David Wood, who is a Member of the AusIMM, (the Australian Institute of Mining and Metallurgy), and a mining engineer with approximately 24 years experience in mining, 19 of which were in coal mining (open pit and underground) has consented to act as a Competent Person subject to the following limitations.

David Wood specifically accepts responsibility for the application of "modifying factors" related to "mining" as set out in Section 5.1.1 of the March 2000 South African Code for Reporting of Mineral Resources and Mineral Reserves (The SAMREC Code). For clarification, David Wood does not, as a Competent Person, warrant satisfactory compliance for the application of the remaining "modifying factors", referred to in Section 5.1.1 of the SAMREC Code, by other persons who may accept responsibility of acting as a Competent Person for this Coal Reserve estimate.

David Wood is an employee of Snowden Mining Industry Consultants and has attained sufficient experience in mining and Coal Reserve estimation that is relevant to the style of mineralisation, type of deposit and mining methods under consideration. David Wood undertakes to qualify as a Competent Person as defined in the "South African Code for Reporting of Mineral Resources and Mineral Reserves – The SAMREC Code", issued March 2000.

The Coal Reserve estimate for the Moatize coal project has been prepared by Snowden for VALE MOZAMBIQUE LDA and is dated 30th June 2009. Snowden has compiled this statement in accordance with the guidelines provided by the March 2000 South African Code for Reporting of Mineral Resources and Mineral Reserves (The SAMREC Code).

This document is intended to be read as reported in its entirety. Snowden consents to reporting of the reserve estimate based on the information in the form and context in which it appears herein.